MARCH 1, 1954

NEWS ISSUE

Electrical World

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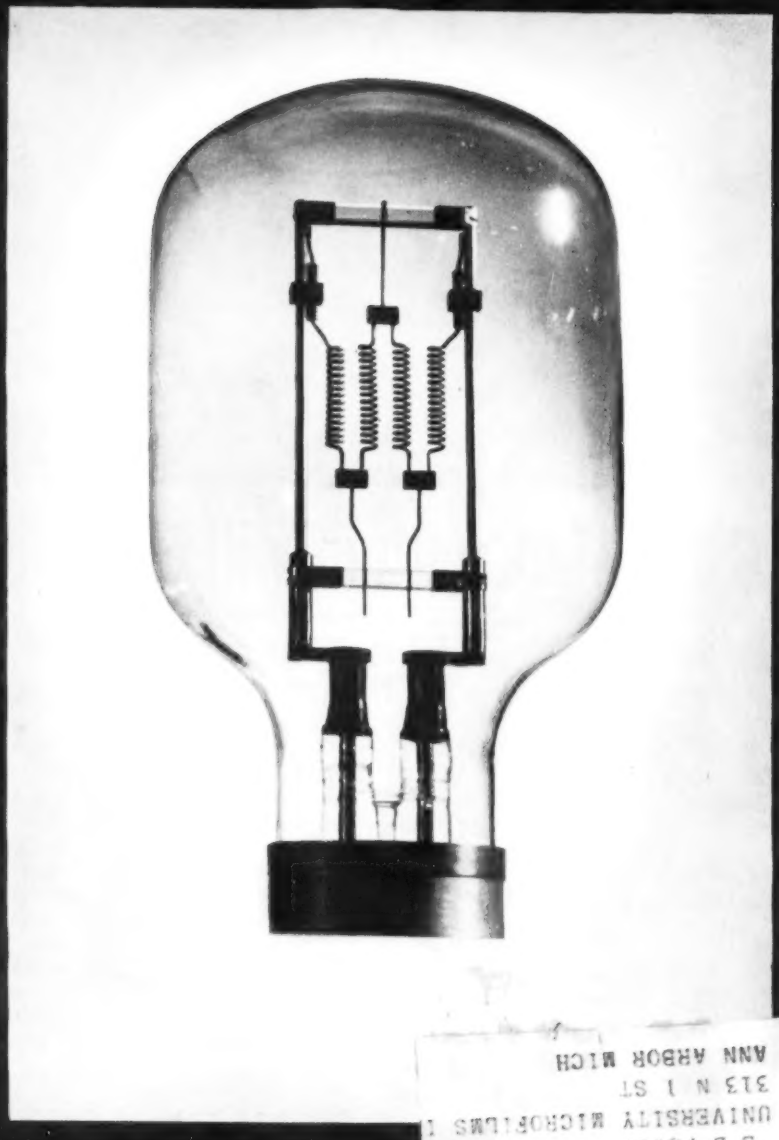

After 75 years . . . . . a 75-kw bulb

See Page 59

E B POWER
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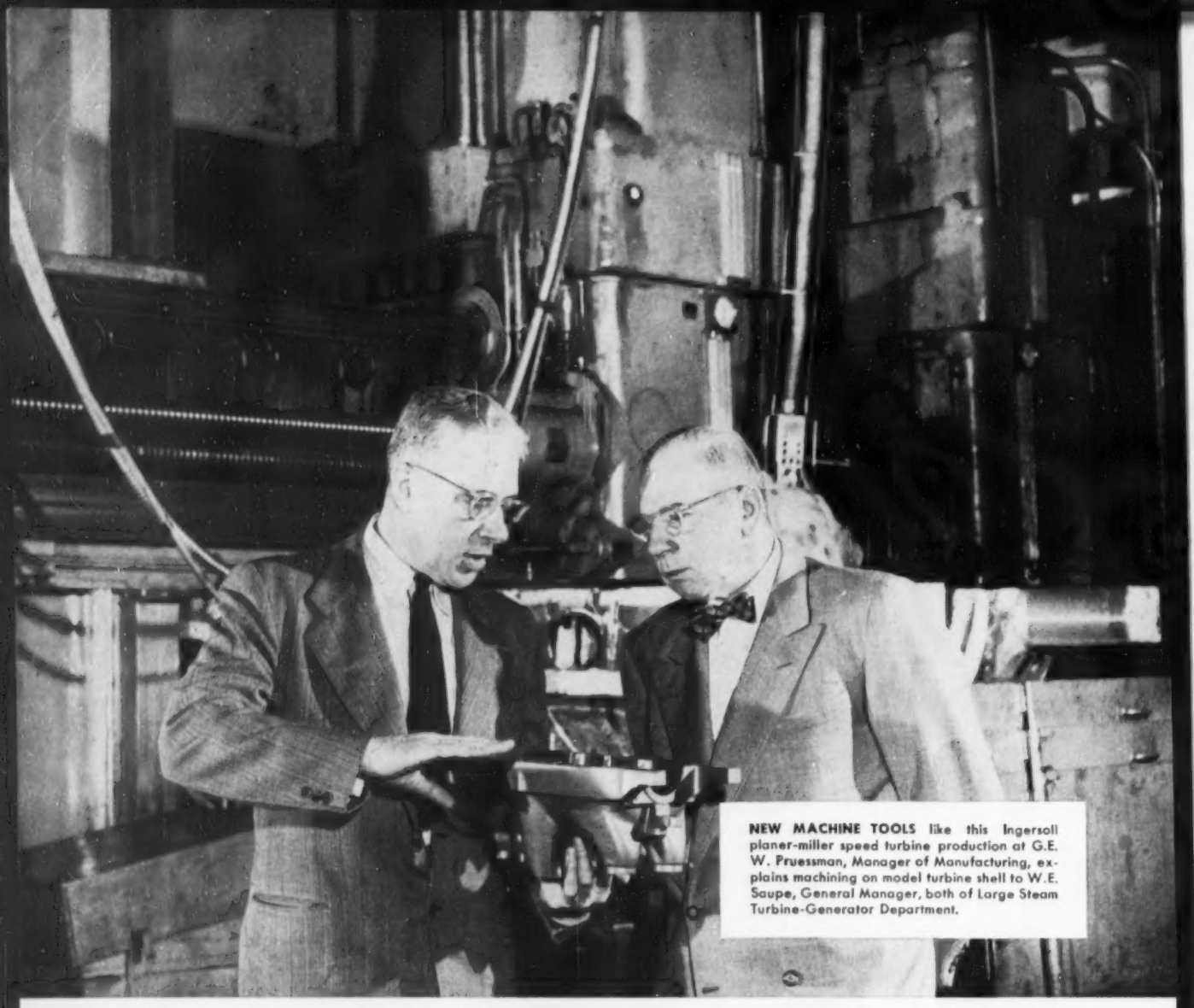


NEW MACHINE TOOLS like this Ingersoll planer-miller speed turbine production at G.E. W. Pruessman, Manager of Manufacturing, explains machining on model turbine shell to W.E. Saupe, General Manager, both of Large Steam Turbine-Generator Department.

G-E turbine output will top 7,000,000 kw in 1954

REHEAT UNITS COMPRISE 92% OF RECORD OUTPUT—AVERAGE SIZE UP TO 119,000 KW TO MEET CONTINUING UTILITY EXPANSION

Pacing the tremendous growth of electric utilities to meet the nation's increasing demands for electric power, General Electric's production of large turbine-generators in 1954 will exceed 7,000,000 kw, a new record that compares with the 6,300,000 kw total for 1953.

NEW DESIGN ADVANCES

Following the trend toward larger units for greater efficiency, the average rating will be about 119,000 kw—almost four times the rating of eight years ago—while more than 92 per cent will be of the reheat type.

Significant advances in turbine-generator design made by G.E. this past year include the engineering and manufacture of a direct, gas-cooled generator rotor, as well as the design of a direct, liquid-cooled generator stator. For greater efficiency, a double reheat turbine has also been designed to operate with steam at supercritical pressure of 4500 psig and initial temperature of 1150 deg. F. This reheat turbine will go into production this year.

FASTER DELIVERY

Experienced personnel, operating new machine tools especially built for G.E., have helped curb rising price trends and made possible faster delivery of turbines. Moreover, the new $3,500,000 turbine product development laboratory, to be completed late this year, is typical of the far-seeing research behind G.E.'s engineering accomplishments that make possible more efficient power generation equipment for the electric utility industry. General Electric Co., Schenectady 5, N. Y. 301-255

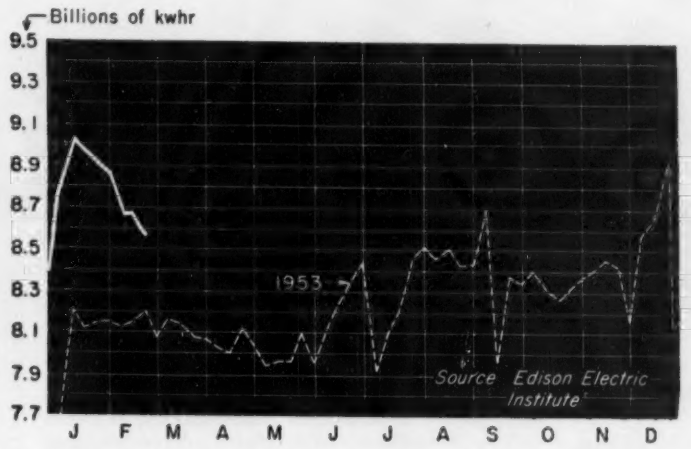
MORE POWER TO AMERICA

GENERAL ELECTRIC

VOLUME 141, NO. 9

March 1, 1954

Electrical World



Output Week Ended Feb. 20—8,551,000,000 Kwhr

Seasonally Adjusted Index†—159.1

Per Cent Change From Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
Feb. 20	+4.3	+3.7	+1.0	−2.9	+5.6	+15.0	+9.5	+2.5	+9.8	+1.8
Feb. 13	+6.6	+5.9	+2.8	−1.2	+7.3	+19.3	+6.6	+6.2	+13.2	+5.4
Feb. 6	+6.7	+4.7	+3.0	−0.4	+7.0	+19.3	+8.7	+5.3	+13.8	+3.5

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Load (Million Kw)	Dec.	81.2	78.1	75.5
Capacity (Million Kw)	Dec.	91.49	89.81	82.05
Production (Billion Kwhr)	Dec.	39.06	36.38	36.45
Hydro	Dec.	8.67	6.91	8.22
Fuel	Dec.	30.39	29.47	28.23
Fuel Consumption				
Coal (Million Tons)	Dec.	10.87	10.17	10.75
Oil (Million Barrels)	Dec.	7.62	6.91	8.60
Gas (Billion Cu Ft)	Dec.	70.78	81.13	59.81
Sales (Billion Kwhr)	Nov.	31.59	32.21	30.08
Residential	Nov.	9.02	8.70	8.16
Commercial	Nov.	5.50	5.62	5.01
Industrial	Nov.	14.95	15.56	14.91
Other	Nov.	2.12	2.33	2.01
Net Income Class A & B Companies ($ Million)	Nov.	84.99*	76.19	80.63
Estimated Dec. '54 Peak (Million Kw)	Nov.	94.7	94.8	96.1
Kwhr per Residential Customer (12 Month Average)	Nov.	2,331	2,318	2,155
Revenue per Kwhr Residential Service (12 Month Average)	Nov.	2.75¢	2.75¢	2.77¢
Canadian Production (Billion Kwhr)	Nov.	5.45	5.51	5.22

Business Statistics

FRB Industrial Production Index†	Jan.	124*	125	132
Gross National Product Annual Rate ($ Billion)	3rd Qtr.	369.0	372.4	345.3
EW 4 Industry Production Index†	Jan.	118.5	120.4	125.3
ENR Construction Cost Index††	Feb.	128.9	128.7	123.1
BLS Consumer's Price Index	Dec.	114.9	115.0	114.1
NEMA Insulation Materials Sales Index†	Dec.	133	130	176
NEMA Electric Appliance Sales Index†	Dec.	69	70	105
NEMA Household Refrig. Sales Index†	Dec.	53	35	75

* Preliminary ** Revised † 1947-49=100 †† 1949=100

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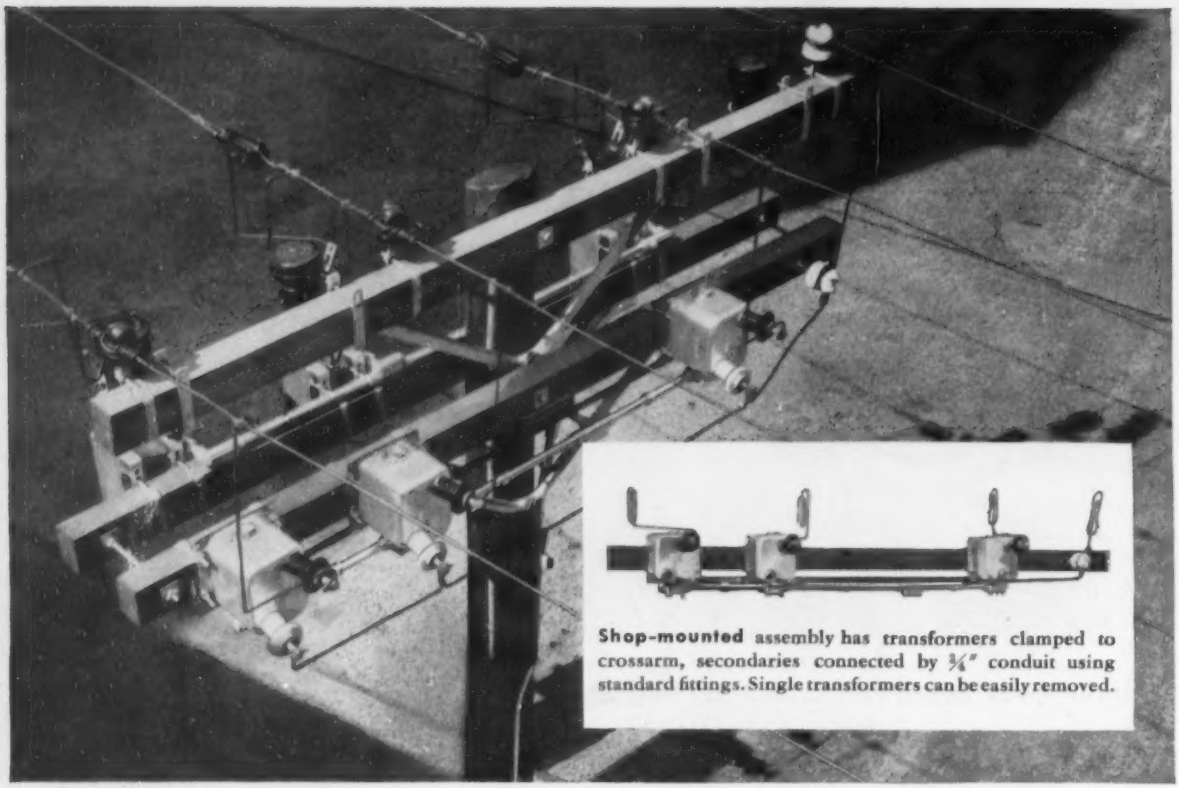


Shop-mounted assembly has transformers clamped to crossarm, secondaries connected by ¾" conduit using standard fittings. Single transformers can be easily removed.

Safer, quicker installations by "shop-mounting"

Westinghouse Instrument Transformers

Mounting and wiring instrument transformers on crossarms in the shop is standard practice at Duquesne Light Company. They've found that it makes new installations easier, quicker, safer and more economical.

Features like sturdy, pressed steel cases and plastic impregnation under vacuum make Westinghouse Instrument Transformers mechanically and electrically strong.

They're easy to hook up, too. Secondary housings on all types and ratings take standard conduit fittings, need no special fittings to make quick, secure connections. Staggered, top-mounted high-voltage bushings make potential transformers easy to hook up in any position.

You choose from the most complete line in the industry when you specify Westinghouse Instrument Transformers. Each type and rating is designed to answer your specific problem. For information contact your local representative; or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-70638

YOU CAN BE SURE...IF IT'S Westinghouse

THE ELECTRICAL WEEK

The Issues News Highlights . . . Interior Department's proposal for disposing of Clark Hill power by selling it to Georgia Power for distribution to preference customers represents a basic change in policy.

President Eisenhower outlines a five-point program for broadening industry participation in development of nuclear power plants.

FPC's order granting Portland General Electric a license for Pelton project is set aside by appeals court . . . Navy plans to build its own power plant to serve Indian Head, Md., powder factory.

Dr Clarence E. Manion, former dean of the Notre Dame Law School and a speaker at the 1952 convention of Edison Electric Institute, asserted the "real reason" the Eisenhower Administration had forced him to resign from a post to which the President had appointed him was his proposal that the federal government sell TVA to private enterprise. Observers had speculated the ouster stemmed from his outspoken support of the Bricker Amendment, which the President opposes. Dr Manion was chairman of the President's Commission on Inter-Governmental Relations, which had been asked to define the spheres of responsibility of federal, state and local government.

Meanwhile, President Eisenhower was involved in another dispute over TVA. He said at his press conference that he saw no reason why city of Memphis should not supply its own electric power instead of asking the Authority to build a new steam plant. Memphis Mayor Frank Tobey disagreed. "According to our contract with TVA," he said, "we cannot buy electric power from any other source. And if we could buy from a private utility, for example, there is none around here that can supply our needs."

James B. Carey, president of CIO's International Union of Electrical Workers, said the union will present a demand for a guaranteed annual wage to the electrical manufacturing industry next month. He accused General Electric and Westinghouse of creating unemployment by overproducing. Both companies denied the charge, pointing out each had more workers on the payroll now than a year ago.

Gov Lee E. Emerson of Vermont announced he supports the proposition that the Niagara River should be developed by New York Power Authority "the same as the St. Lawrence power should be developed."

To keep the Pacific Northwest abreast of its power requirements, $200 million a year in new investment will be needed, Paul J. Raver, superintendent of Seattle City Light and former BPA administrator, told the Seattle Association of Credit Men.

Off the Washington Wire . . . Senate Public Works Committee still has not set a date for the Niagara power hearings. Sen Herbert Lehman and Rep Franklin D. Roosevelt Jr, both Democrats from New York, have introduced bills to permit the state to develop Niagara for more power, with preference to go to public bodies and cooperatives.

United States Court of Appeals turned down two motions to reconsider its decision upholding FPC on its license to New York Power Authority for the St. Lawrence project. Last step open to opponents: The Supreme Court.

Interior Department has ordered a sizable cutback in personnel of Southwestern Power Administration and a sweeping reorganization to make the cutback possible. SPA's Washington office will be discontinued and the entire organization reduced from 256 to 180 positions by May 1. Later the work force will be cut to 86 positions.

After a bitter fight over water rights, British Columbia Power Commission received a go-ahead to build its $2.5 million Buttle Lake Dam on Vancouver Island. Fishing and forestry interests had opposed the dam, which will back up water for the John Hart project.

Northwest Public Power Association refiled its protest to FPC on project cost allocations at McNary Dam. FPC had rejected the association's original petitions. NPPA objects to the fact that 92% of total project cost was assessed against power, instead of 50% as under the "Bonneville formula."

Consolidated Edison Co of New York adopted the IBM postcard billing system.

South Carolina Legislature has before it a bill to authorize municipalities in Spartenburg County to furnish power to industrial and residential customers outside their corporate limits.

Contract negotiations will resume tomorrow between Virginia Electric & Power Co and an IBEW local representing 2,600 workers. The union seeks a pay increase and fringe benefits; the company wants a two-year contract in place of the present one-year pact.

Condemnation suit that Chelan County PUD No. 1 began eight years ago against Washington Water Power facilities within the county will come up again May 24 in superior court there. At that time the court will hear testimony on value of the company's facilities, which includes the 56,000-kw Chelan Plant.

Obituary . . . Robert G. Ely, vice president of Connecticut Light & Power Co, died Feb. 20 at Farmington, Conn.

Proposal on Clark Hill: A

Interior's support of Georgia Power Co's offer for delivering power to preference customers from federal project expected to have wide effect on existing public-private contracts

Assistant Interior Secretary Aandahl:
". . . . reasonable and equitable"

Co-op attorney Ellis Arnall:
". . . . of doubtful legality"

Georgia Power Pres Harllee Branch:
". . . . all rights assured"

Long-awaited government plan for marketing power in Georgia has been unveiled, disclosing a significant new course in federal power policy.

The precedent-setting proposal, still subject to modification, adopts the main objectives of the Georgia Power Co plan for disposing of power from the federal Clark Hill Project to preference customers in the state.

As announced by Assistant Interior Secretary Fred G. Aandahl, Feb. 17, the new marketing proposal differs from prevailing contracts in these important particulars:

- Entire share of Clark Hill output allocated to the state would be sold directly to Georgia Power Co for delivery to preference customers in amounts specified by Interior.
- Existing company-customer relationship would be maintained.
- Preference customers would be guaranteed a pro-rata share of the federally produced power by means of a secondary contract with Interior.
- Additional power needed by preference customers would be supplied by the company under a third contract.

As was expected the government proposal brought immediate and vigorous protests from public power advocates. Georgia's Ex-Gov Ellis Arnall, now representing the Georgia Electric Membership Corp, labeled the scheme "improper" and contended it was of "doubtful legality." GEMC, composed of 37 distribution co-ops in the state, is the most vocal of the Georgia preference customer groups.

Harllee Branch, Jr, president of Georgia Power, said that if the proposed contract is adopted it will:

- Assure all of the rights to Clark Hill power of Section 5 of the Flood Control Act of 1944.
- Make the power available to preference customers at the lowest possible cost.
- Provide the most immediate and widespread distribution of the power to preference customers under government control at all times.
- Insure the fullest and most economical utilization of power generating facilities at Clark Hill so as to assure an orderly amortization of the government's investment.

Preference customers in Georgia have until March 19 to study and comment on the Interior Department proposition. While there may be negotiation on details, it is believed that the broad outline of the proposal will remain intact in contracts offered preference customers for purchase of Clark Hill power.

Broad Significance

If the Georgia proposal is written into contracts, it will set the new Republican pattern for marketing power from federal projects. Contract negotiations involving some 12 electric companies and five generation and transmission co-ops in Missouri and nearby areas have been stalled for months awaiting the Georgia decision. Present wheeling contract between Interior and Virginia Electric & Power Co can be rewritten to conform to the Georgia proposition if Vepco chooses.

Assistant Secretary Aandahl said in announcing the proposal that the White House was aware of it, but "not a single iota of approval" has come from that direction. He noted that the proposal, in fact, still lacked formal Interior Department approval, since it was subject to modification.

However, Aandahl left no doubt that the proposal had McKay's backing. At a meeting with Georgia co-op officials Aandahl said he believed the proposal was reasonable and equitable in value. "We are now advising preference customers that we are ready to proceed on this basis," he said.

Interior's duty, he said, was not only to make sure that preference customers got the power but that it

Basic Change

be sold to bring in revenue for the government. He noted that all of Georgia's share of Clark Hill power would serve only one-third the total needs of preference customers in the area served by Georgia Power Co.

Aandahl vs Arnall

No sooner had Aandahl explained the tri-contract proposal than Arnall was on his feet to reject it. He said he and his client, GEMC, was disappointed that they had not been asked to express their views on the proposals since Sept. 1 of last year.

"We start out on the assumption that this contract is unacceptable," Arnall told Aandahl. "It is no more than a reworking of the Georgia Power contract. I am of the mind that it is improper and of highly doubtful legality."

Noting that he had only looked over the proposal briefly, Arnall made these comments:

- Proposal appears to give Georgia Power status of a preference customer, which it is not entitled to by law.
- Proposed contract between the government and preference customers deals with only a part of the power available from the project. He was evidently referring to the peaking capacity which Georgia Power would be allowed to buy for system needs.
- What GEMC members are concerned about is title to the Clark Hill power. Once we get title to it we could trade it to Georgia Power with sufficient conditions to preserve our rate structure.
- There would seem to be considerable doubt as to whether the preference clause would be carried out under this proposal.

The "Clark Hill tri-contract proposal" would work in this manner:

First contract would be between the government and Georgia Power. Under it the company is to receive one-half the power from the project. Other half is for delivery in South Carolina. The Georgia share, amounting to approximately 350 million kwhr annually, would be fed into the company system where it would be firmed and an equivalent amount of power, less line and transformer losses, would be delivered to preference customers. The government would designate preference customers and amount delivered to each.

The company would reimburse the government for Clark Hill power at the rate of $9 per kilowatt year of capacity and at the rate of 3.4 mills per kwhr for energy. The company would, in turn, deliver equivalent amount of power to preference customers and bill them at the rate of $9 per kilowatt year of capacity and four mills per kwhr for energy. At the 45% load factor specified average power cost to preference customers would be 6.28 mills per kwhr.

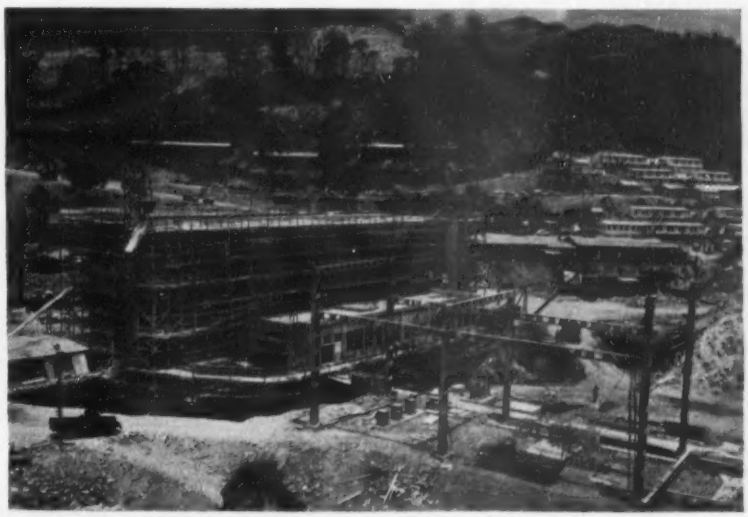
In this contract, provision is also made for sale of peaking power from the project to the company. As much as 40,000 kw of capacity can be made available for which the company agrees to pay $9 per kilowatt year and 3.4 mills per kwhr.

The contract is for a 15-year period but may be cancelled on three-years notice by the government. As much as 10,000 kw capacity may be withdrawn by the government on six-months notice.

Second contract would be between the government and the preference customer to assure each customer his proper share of government power at rates specified by the government.

Third contract would be between the electric company and the customer. Under it provision is made for delivery and rates of the federally produced power. In addition, under this contract the company agrees to supply all needs of preference customers in addition to that received from Clark Hill. This power is to be at the company's regular rate for that type of customer computed on the basis of consumption, including both government and company power.

For its services, Georgia Power will receive .31 mills per kwhr for transmitting and firming government produced power to all preference customers on its system. The government rate to co-ops will be 6.28 mills per kwhr as compared to the company rate of 6.67 mills per kwhr.



Work Advances on Snowy Project

The Munyang Power Station (above), one of 17 power plants in Australia's Snowy Mountain project in New South Wales, is rapidly taking shape. This is how the plant looked late in January. In addition to power plants, the project will include 7 large dams, 80 miles of tunnel, and 400 miles of aqueduct.

The project's future, however, has been in doubt because of opposition voiced by the Australian states of New South Wales and Victoria, who claim that by the time work is completed uranium will provide cheaper power. They also allege a large federal expenditure will deprive their own power projects of much needed funds. The plan, initially estimated to cost about $550 million, will now cost close to $1.3 billion. A recent Commonwealth-State conference to discuss the project's future has been postponed indefinitely.

President Offers 5-Point Plan for Industrialization of Atom:

- **Relax statutory restrictions against ownership or lease of fissionable material and of facilities capable of producing fissionable material.**
- **Permit private manufacture, ownership and operation of atomic reactors and related activities, subject to necessary safeguards and under licensing systems administered by Atomic Energy Commission.**
- **Authorize AEC to establish minimum safety and security regulations to govern the use and possession of fissionable material.**
- **Permit the commission to supply licensees special materials and services needed in the initial stages of the new industry at prices estimated to compensate the government adequately for the value of the materials and services and the expense to the government in making them available.**
- **Liberalize the patent provisions of the Atomic Energy Act, principally by expanding the area in which private patents can be obtained to include the production as well as utilization of fissionable material, while continuing for a limited period the authority to require a patent owner to license others to use an invention essential to the peacetime applications of atomic energy.**

President Eisenhower has sent to Congress recommendations for relaxing the Atomic Energy Act to encourage broader industry participation in development of peacetime nuclear power.

In general, the President asks that private industry be permitted to own and use atomic power plants and the fissionable material necessary for their operation. He also asks for a gradual easing of patent limitations over a five-year period so that industry may acquire standard patents on inventions relating to the production of nuclear power. Under present law all such patents are government property.

Delay Seen . . . Proposals for industrial development of nuclear power were sent to Congress in the same package with proposals for sharing weapon-use and nuclear power information with friendly nations. Because of this, the necessary legislation for domestic industrial development is sure to be slowed down. Just how much is up to Congress.

In his message, the President gave precedence to the international aspects of his proposals for sharing atomic energy information. Leaders in Congress seriously are considering separating the various proposals for legislative action.

This would simplify matters for Congress and the public, but it would not necessarily assure approval of the domestic atomic energy proposals. In an election year with a short session in prospect, it may well be that the joint Congressional Committee on Atomic Energy simply will not be able to get the legislation in shape for presentation. Even if it does, Congress may not find time to take it up for final action.

While there is relatively little opposition to bringing industry in on nuclear power development, there is a corresponding lack of zeal for pushing the amendments through this year. Main opposition comes from public power and labor groups which want the government to retain its monopoly in the atomic power field.

Up to now, industry has been reluctant to commit any large sums of money for actual construction of a nuclear power plant. For one thing, the economics of such a plant largely are unknown. For another, the present law prohibits private ownership or control of atomic power plants or fissionable material to fuel them.

However in recent weeks, a number of electric utilities have made offers to participate in the construction and operation of AEC's first utility-size nuclear power plant. This plant, now on the drawing boards at Westinghouse Electric Corp, is scheduled for completion in three or four years at a total estimated cost of $45 million (EW, Feb. 8, p 71).

Package Power Reactor . . . Industry may get another chance to participate in development and construction of one or more smaller nuclear power plants within the next few months. Department of the Army is known to be interested in building a so-called package power reactor for use at one of its larger installations.

This small plant would have a capacity of about 20,000 kw—about equal to the capacity of the engine of the first atomic-powered submarine, the Nautilus.

For several years a number of private corporations have been collaborating with AEC in studies on the economic feasibility of nuclear power. Some of these studies have progressed to the point of actually designing a power reactor for industrial power production.

Broader Participation . . . In his message to Congress, President Eisenhower said:

"The creation of opportunities for broadened industrial participation may permit the government to reduce its own reactor research and development after private industrial activity is well established. For the present, in addition to contributing toward the advancement of power reactor technology, the government will continue to speed progress in the related technology of military propulsion reactors.

"The present complementary efforts of industry and government will therefore continue, and industry should be encouraged by the enactment of appropriate legislation to assume a substantially more significant role."

Jubilee Theme to Play Role in Lighting Contest

Tying in Light's Diamond Jubilee celebration this year, a lighting competition for electrical contractors is being sponsored by Electrical Construction and Maintenance, a McGraw-Hill publication.

Eighteen cash awards, totaling $1,350, will be given for the best lighting installations, including Jubilee lighting displays, completed on or between Aug. 1, 1953, and Dec. 1, 1954, the deadline for entries.

First, second, and third awards, of $100, $75, and $50, respectively, will be given for each of six types of lighting installations: stores, schools and offices, industrial, residential, floodlighting, and miscellaneous (banks, museums, hospitals, churches, theaters, etc). Any employee of a regularly established contracting firm may compete.

Boston Marks Light's Diamond Jubilee

Boston last month joined the growing number of communities which have held celebrations in honor of Light's Diamond Jubilee. The Boston ceremonies consisted of a luncheon sponsored by the Advertising Club and Electric Institute of Boston in which all branches of the electric industry participated. Speakers and guests pictured at head table are (l to r) John I. Ahern, New England Electric System; C. E. H. Palmer, General Electric Co; Massachusetts Gov C. A. Herter; Philip Reed, GE chairman; E. C. Connelly, president of Advertising Club; Thomas G. Dignan, Boston Edison Co president and chairman of the institute's jubilee committee; J. C. White, representing Boston's Mayor Hynes; Dr Bradford Washburn, director of Boston's Museum of Science; J. Dore, Jr, Boston Chamber of Commerce; and H. P. Turner, Westinghouse Electric Corp.

Reed reviewed Thomas A. Edison's career and predicted great expansion of the utility industry in the next half century. Importance of scientific demonstration was stressed by Dr Washburn. Dignan served as master of ceremonies.

Appeals Court Sets Aside FPC's Pelton License

Federal Power Commission's order issuing a license for Portland General Electric Co's Pelton Project on the Deschutes River in central Oregon was set aside Feb. 18 by the Ninth Circuit U. S. Court of Appeals.

The $22-million hydroelectric project calls for a 200-ft high dam and a 36,000-kw power plant, both on government-owned land, plus a re-regulating dam on private property 3 miles below the high dam. FPC issued a license for the project, basing its authority on the fact that the dam would occupy government land.

In a 2-1 decision, the majority opinion contends FPC exceeded its legal jurisdiction in granting the license. "Ownership of the power dam site does not empower the U. S. government to use the waters of the Deschutes River either at the site of the dam or elsewhere," declared Judges Albert Lee Stephens and William E. Orr.

The ruling accuses the FPC of entrenching upon Oregon's sovereignty. The majority opinion explains, "We think the regulation of a river as it flows through the state is one of the powers of the state's sovereignty and includes regulatory powers as to fish in state waters."

In a dissenting opinion, Judge William Healy contended the sole grievance against the proposed project is that it will halt the ascent of fish, and that those objections were met by the power company in their offer to install facilities for trapping fish and taking their eggs, plus enlarging the capacity of existing hatcheries.

The petition for review to set aside the FPC order was filed by the State of Oregon, the Fish Commission of Oregon, and the Oregon State Game Commission. They based their request on claims that the dam would create a hazard to fish and that the FPC couldn't grant a license legally.

Navy Steam Plant

Generating facilities to be constructed at Indian Head installation now served by Pepco

Navy will build its own 10,000-kw steam-electric generating plant to serve the naval powder factory installation at Indian Head, Md.

This action comes at a time when many government agencies are looking toward shifting their loads from uneconomical on-site plants to outside utilities. However, the Potomac River Naval Command which bosses the Indian Head factory claims the new government plant is needed to furnish a reliable source of process steam and "improve the reliability of electrical power." The command further claims, without giving figures, that the plant will save "considerable money annually" to U. S. taxpayers.

Served by Pepco . . . Power needs of the naval installation now are served by Potomac Electric Power Co over a 69-kv line from its Washington plants. The naval station is approximately 30 miles south of Washington.

An on-site obsolete steam plant has been serving the installation as a stand-by power source and supplying process steam for powder factory.

Some outside engineers are inclined to question the Navy's decision to build the $4.5-million plant at Indian Head. They will concede that the present steam-generating plant at site is obsolete and should be discontinued. However, they make these points:

(1) Factory has two modern boilers to supply adequate quantities of process steam; (2) Pepco has supplied installation for 12-year period with a minimum of outages; (3) another Maryland naval installation is served by an outside utility and has indicated no concern over vulnerability of power source.

IN THE INDUSTRY

QUESTION, put to a spokesman for Babcox & Wilcox Co, which announced last week it had an atomic powered locomotive on its designing boards: Once you design it, do you plan to sell it?

ANSWER, by the spokesman: "We'll sell it if anybody wants to buy it. If someone wants to build the locomotive, we expect to be ready to install a reactor as its power plant."

And now, an atomic locomotive

Which leads to another question, this one for the electrical industry: Will the atom go commercial as a means of propulsion (submarines, ships, atomic locomotives) before it does as a new source of central station electricity?

And this will continue to be a question until actual atomic propulsion and central station units have been put into full-scale operation, so the economics of each may be checked. Recent developments indicate that full-scale tests of this sort may not be far off.

In the case of the locomotive, the situation is this: On Feb. 9 Dr Lyle B. Borst, professor of physics at the University of Utah, revealed that an atomic powered locomotive had been developed after a year of cooperative work by five railroads and a group of manufacturing firms, among them Babcox & Wilcox.

Railroads First? . . . Dr Borst, who directed the research program, indicated railroads might be the first private industries to employ atomic power for peaceful use.

"Although previously thought to be some ten years away," he said, "an atomic powered locomotive now seems around a much closer corner than originally believed."

Design of the locomotive is being done by the Atomic Energy Division of Babcox & Wilcox, which also is participating in stationary power plant feasibility studies with Atomic Energy Commission. The spokesman pointed out, however, that the operation was entirely separate.

It is, according to Dr Borst, "the first nonclassified, nonsecret study of the technical industrial use of atomic power in the United States." Following World War II the physicist, who has been at the university since 1951, supervised construction, design and operation of AEC's nuclear reactors at Brookhaven, L. I.

His present reactor would be fueled by uranyl sulphate, a liquid form of uranium. Steam produced in the reactor, a pressurized water type, would drive electric generators which would produce power for the locomotive's wheels. He estimated the motor would develop 7,000 hp, and run for a year on 11 lb of fuel.

The engine would be built in two 80-ft sections. The forward section would have 12 axles to support the weight of the reactor. Although the reactor itself would be only 2 ft wide, 3 ft high and 3 ft long, it would be shielded by a massive steel container 4 ft thick and weighing 200 tons. Engineer's compartment and controls would be housed in a cab forward of the reactor. Second section would house radiators to get rid of excess heat produced in the reactor.

Depends on Cost . . . Dr Borst set construction cost for the first locomotive at $1,200,000, as compared with a cost of about $770,000 for a diesel combination producing the same amount of power. Whether lower fuel and operating costs would offset the differential remains to be determined.

C. H. Gay, vice president in charge of B&W's atomic division, said that although his company is convinced such a reactor can be designed, many problems stand in the way before the job is finished. Some of the problems include arranging for a sufficient amount of heat exchange between the fuel and the pressurized water in the limited space available and overcoming the obstacles of corrosion and neutron damage.

"How well these problems can be overcome will have a great bearing on the efficiency of the power plant of the locomotive and consequently on how soon it will be built."

As another spokesman for the company put it: "If we can make money on it, we will build it." And that about sums up the position the power companies find themselves in in their own approach to electric power from the atom.

TECHNICAL NOTES

ARCHER E. KNOWLTON

Explosive pulverization of coal at 75 psig, compressed air-coal ratio of 0.7 to 1.0 pound can, in a single pass produce a product 80% of more of which will pass a No. 325 U. S. sieve.

Douglas fir and western larch do not have the deep, readily treated ring of sapwood that is characteristic of southern or ponderosa pine.

Double furnace design will permit steam generator ratings adequate for steam requirements of turbine twice as large as recently attained.

Capacitors, particularly electrolytic, probably cause the most elusive trouble in power plant electronic controls. Troublesome leakage at normal high operating temperature may disappear when the chassis is removed and exposed to ventilation.

Subtransient reactances, negative sequence reactances, and maximum possible induced currents in short-circuited rotor windings of synchronous machines can be measured without uncoupling the turbine or moving the rotor successively through small angles.

All coolants for nuclear power reactors, with the exception of helium, become radioactive. For ordinary water the induced radioactivity has a half life of 8 seconds, sodium has 15 hour half life.

Regulating slope built into a turbine speed governor to permit stable operation in parallel with other units prevents the governor being a true speed control device.

Surplus kilovars from charging current on long transmission lines or cable would be peculiarly appropriate for excitation of induction generators.

Low (Arctic) temperature power cable has a dielectric comprised of 87 parts of butadiene and 13 parts styrene combined at 122 F.

Series capacitors can only reduce the circuit reactance back to the source. If source impedance is mainly resistance, little benefit will be derived from the capacitor.

SAVE SAFELY on peak load protection

KEARNEY FUSE LINKS

4 Specialized

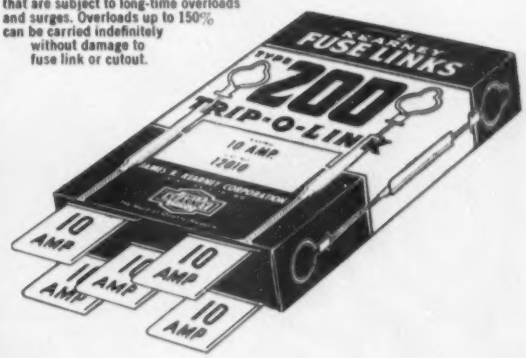
types for maintaining service on troublesome circuits

Keep your troublesome circuits operating even under most difficult conditions—by re-fusing with KEARNEY links. They will save you more in maintenance—and do it *safely*. Equipment gets full protection from overloads and surges.

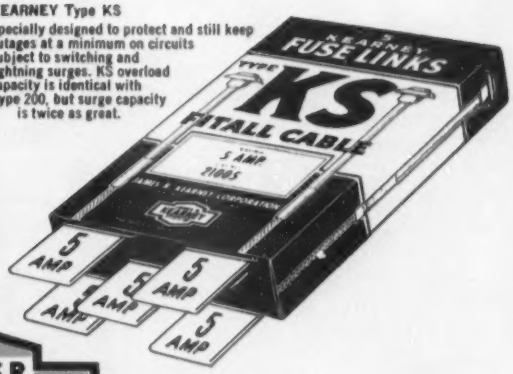
All KEARNEY links are color-coded to save your crews time and trouble, packaged for easy handling, and made with the accuracy you need for top protection. Time-current curves and charts are available to help you work out your coordination problems.

JAMES R. KEARNEY CORPORATION
4224-42 Clayton Avenue, St. Louis 10, Missouri
Canadian Plant—Guelph, Ontario

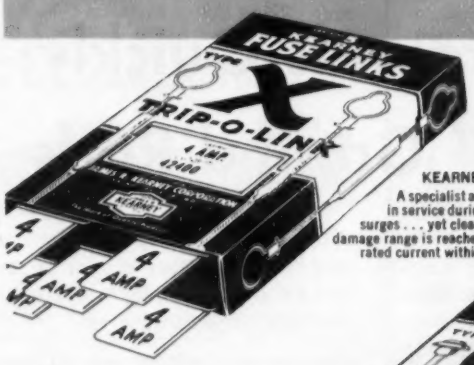
KEARNEY Type 200
Specially made for troublesome circuits that are subject to long-time overloads and surges. Overloads up to 150% can be carried indefinitely without damage to fuse link or cutout.



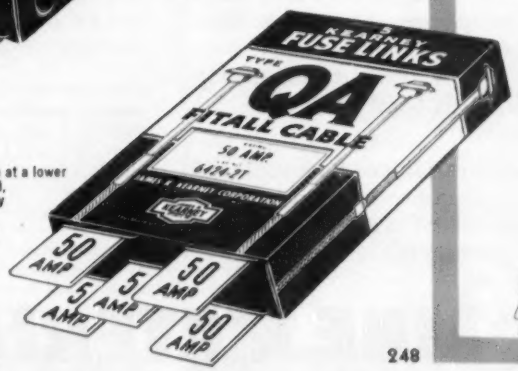
KEARNEY Type KS
Specially designed to protect and still keep outages at a minimum on circuits subject to switching and lightning surges. KS overload capacity is identical with Type 200, but surge capacity is twice as great.



FOR BETTER CONSTRUCTION — JAMES R. KEARNEY CORPORATION ST. LOUIS, MO. GUELPH, ONT. — FOR SAFER MAINTENANCE



KEARNEY Type X
A specialist at keeping transformers in service during heavy overloads and surges . . . yet clears the fault before damage range is reached. Opens 230% of rated current within five minutes.



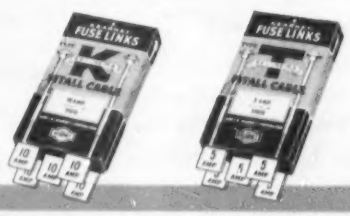
KEARNEY Type QA
The QA link is designed to open at a lower percentage of rated current, and, therefore, will melt more rapidly than fuse links of the same ampere rating which have been designed to open 230% of rated load within five minutes.

Standardized

types for EEI-NEMA Standards

In cooperation with EEI and NEMA, KEARNEY has developed K (fast) and T (slow) fuse links to meet industry-wide, time-current standards . . . *in addition* to giving you such exclusive KEARNEY features as:

1. True mechanical interchangeability
2. Greater accuracy and dependability
3. Packages are color-coded (gold for Type K—silver for Type T) to assure fool-proof identification and save time on the job.
4. Easy-to-use, "pull-out" package.



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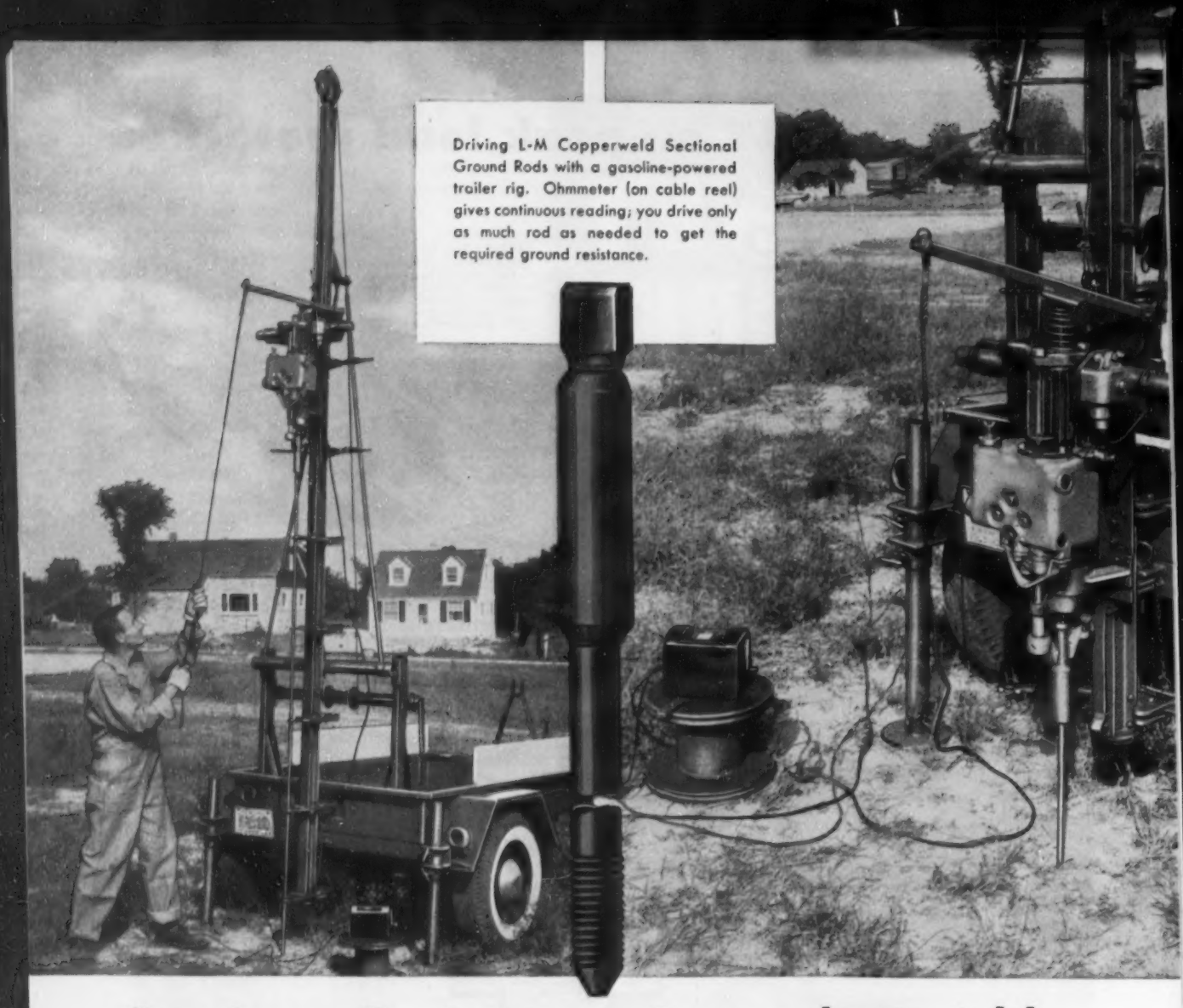

Driving L-M Copperweld Sectional Ground Rods with a gasoline-powered trailer rig. Ohmmeter (on cable reel) gives continuous reading; you drive only as much rod as needed to get the required ground resistance.

Get Low-Resistance Grounds Quickly; Drive L-M Copperweld® Ground Rods

Stocks in All L-M Warehouses Assure Prompt Delivery to You

Order from the L-M Field Engineer or phone your district L-M Sales Office for the Copperweld Standard or Sectional Ground Rods and Fittings you need. Always plenty right in stock.

Copperweld Ground Rods and Fittings are available from L-M warehouses all over the country. That means you get prompt delivery, when you order Copperweld Grounding Equipment from the L-M Field Engineer.

Copperweld Ground Rods consist of a thick copper covering, inseparably molten-welded to an alloy-steel core that provides strength and rigidity. Copper and steel are permanently interlocked, so they cannot be separated by pounding, temperature changes, or years of service.

For complete information on L-M Copperweld Ground Rods, ask the L-M Field Engineer for a copy of Bulletin DL-4; or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

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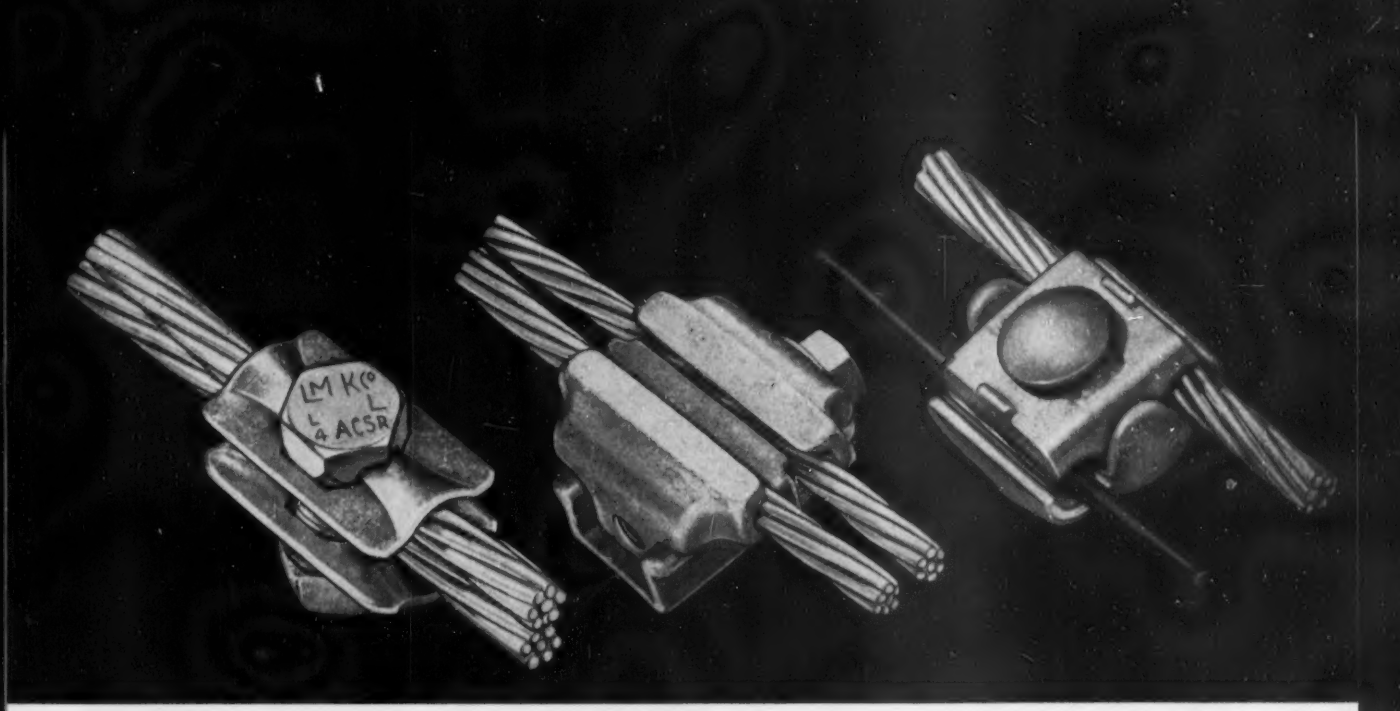
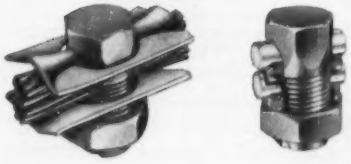
LINE MATERIAL

Line Construction Materials

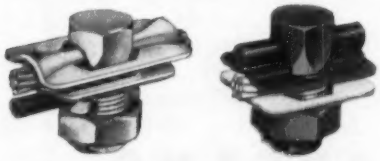


ONLY L-M Offers All 3 Types of Connectors for Aluminum

1–SPLIT BOLT



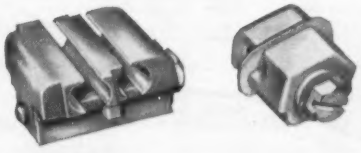
For Al to Al: Type AA, left, is plated bronze with two aluminum washers. For #2 to 4/0 solid; #4 to 4/0 ACSR. Type PB, right, is a plated bronze connector with plated spacer bar. Sizes from #2 to 4/0 solid aluminum; #4 to 4/0 ACSR.



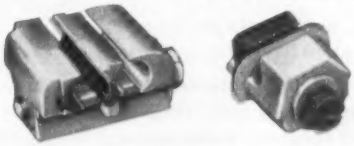
For Al to Cu: Type AC, left, is plated bronze with one aluminum and one bimetal washer. Five sizes, for #2 and 1 solid, #4 to 4/0 ACSR, and #2 to 4/0 solid copper or #3 to 4/0 stranded copper. Type CA, right, has a bronze body with two bimetal washers. In a full range of sizes from #6 solid aluminum to #4/0 ACSR, and #6 solid copper to #4/0 solid or stranded.

L-M Split Bolt and Fargo Vise-Type Connectors fully meet new standards of the Electrical Service Connector Institute.

2–VISE TYPE

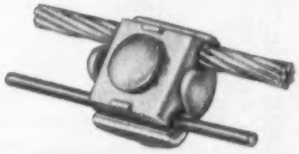


For Al to Al: The famous Fargo vise-type connectors provide wide contact surfaces and massive design for greater heat dissipation; always threaded; no loose parts. At left, No. 9000-3, for sizes up to and including 397,500 Al; No. 9000-1, right, for #4 ACSR and smaller.



For Al to Cu: The vise-type principle in cast alloy with bimetal inserts, for aluminum to copper connections. No. 9000-4 at left is for sizes up to and including 397,500 Al. No. 9000-2 at right is for #4 ACSR and smaller.

3–CLAMP TYPE



For Al to Al: One-Bolt Parallel Groove Clamp, No. CL10X, for Al to Al connections. Clamp casting is aluminum, with galvanized steel square shank bolt, washer, and nut. For ACSR #6 to 4/0, #4 to 1/0 armored.

For Al to Cu: One-Bolt Parallel Groove Clamp, No. CL10X, same as above, except that copper liners are brazed to aluminum body on tap side. For copper taps #12 to 2/0. Also in all bronze for copper-to-copper connections.

Ask L-M's Connector Headquarters for Information

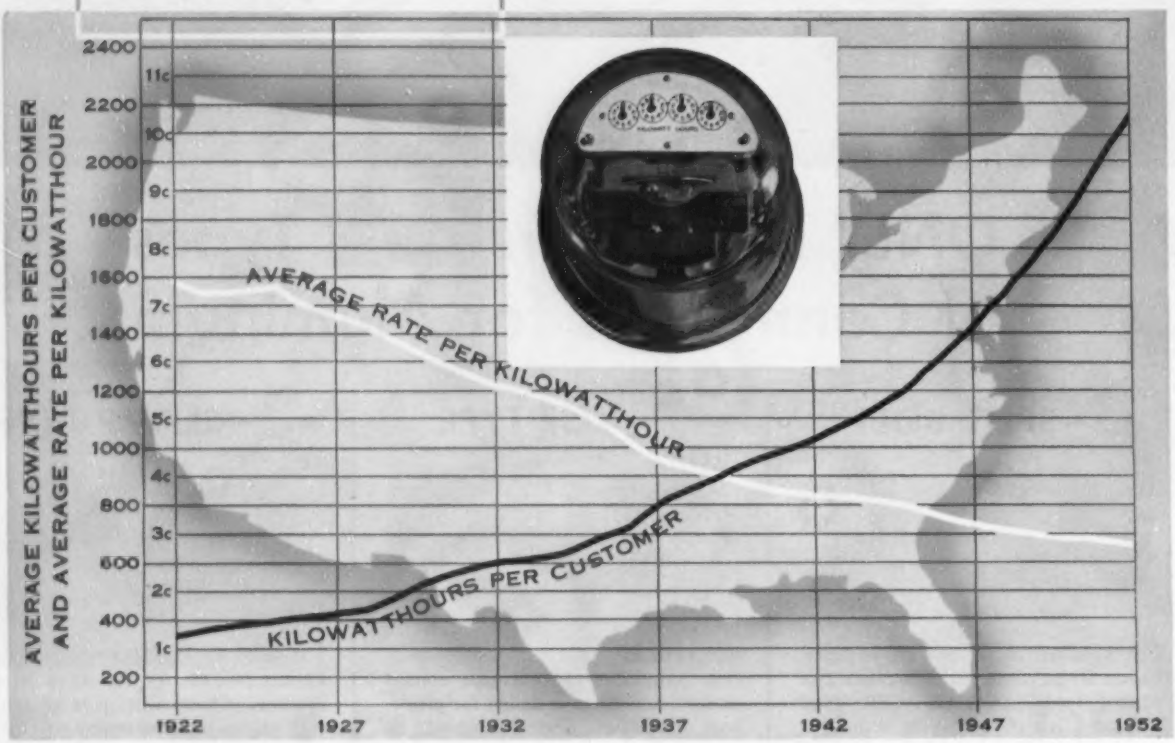
Years of research and development by L-M Engineers assure the best connectors and a full range of types for aluminum, copper, and combinations. See the L-M Field Engineer or write for bulletin. Line Material Company, Milwaukee 1, Wis. (a McGraw Electric Company Division).

LINE MATERIAL *Connectors*

Complete Coordinated Equipment for Distribution Today

a full measure of value

Sangamo J Meters



Throughout the years, with steadily lowered rates, Utilities have given consumers a full measure of value.

Just as rates have gone down, meter costs per kw of capacity have gone down and values have been increased.

Meter department executives want definite overall values from the watthour meters they buy. They look for such values as—sustained accuracy under varying temperatures . . . quiet long-life operation . . . ease of calibration and repair . . . resistance to corrosive atmospheres . . . ample capacity to measure heavy loads—values that add up to minimum maintenance. These and many other values have made Sangamo J Meters the choice of metermen everywhere.

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

Only Measured Facts are Known Facts

JM53-7

FEATURES of Consumers Power's Whiting Station are explained by J. H. Foote, Commonwealth Services, to A. M. De Bellis, chairman of EEI Electrical Equipment Committee, and E. B. Ripley, Connecticut Light & Power Co. C. E. Asbury, also of Commonwealth Services, looks on

System Reinforcement . . .

. . . discussed by EEI Electrical Equipment Committee. Long Island Lighting engineers tell how company is expanding system

System reinforcement to serve rapidly growing loads was focal point of discussion at Edison Electric Institute Electrical Equipment Committee meeting at Detroit, Feb. 15-16.

Power station construction to meet Long Island Lighting Co's annual growth rate of 19% in peak demand and 25% in kwhr consumption was described by W. Welch, Jr. Planning was facilitated greatly, he said, by use of the ac network calculator and complete system maps.

Outdoor generating stations have proved themselves on Long Island system, Welsh said. Use began with semi-outdoor Port Jefferson plant in 1948. Each subsequent unit has had more equipment exposed, until savings from that change alone exceed $4 per kw of capacity. Experience has shown outdoor plants make less noise and are approved by operating personnel, he stated.

Transmission and distribution expansion has stressed importance of kilovar control and better service reliability on the Long Island system, A. C. Sugden said. Adding 130 Mvar of capacitors boosted power factor from 79 to 92%. And 69-kw lines have been improved by impedance or pilot-wire relays to speed clearing, supervisory control of breakers, and lighting shield wires, he said.

Some lines will be reinforced, and a few long lines converted to 138 kv, Sugden continued. Growing use of high-voltage cable has an additional gain in kvar supply. Power factor may go to 0.9 leading for light loads, he said, and shunt reactors may be used to retain system stability.

Another capacity gain is conversion of 23-kv circuits to 33 kv. But Sugden observed economy here depends upon ability to absorb replaced equipment in unconverted areas.

Virginia Electric & Power Co's expansion has been expedited by establishing a system planning group, G. M. Tatum stated. Methods used somewhat resemble those of Long Island Lighting, but Vepco questions ability to serve built-up areas adequately with 12.5 or 13.2-kv primaries. Moreover, unit substations have proved more costly than field assembled conventional installations in most cases, he said.

Contribution of J. R. Whiting Station to Consumer Power Co's system was described by J. H. Foote, Commonwealth Services, Inc. Recent completion of its 125-Mw unit gives the plant 325-Mw capability. Its cost, including step-up to 138 kv, will total $138 per kw, Foote said. Station is totally enclosed with hollow tile, selected from 15 alternative methods for low overall cost. Average heat rate at 1,450 psig, 1,000F/1,000F reheat has been 9,495 Btu per net kwhr.

Maintenance of outdoor steam-generating equipment has proved easier than indoor, said J. S. Newbold, Carolina Power & Light Co. But inspection outages of outdoor turbogenerators require 5 to 10% more time for protection against unfavorable weather. Outstanding difference he finds for water and air lines where anti-freeze equipment requires extra care.

American Power Parley to Hear McKay, Moses

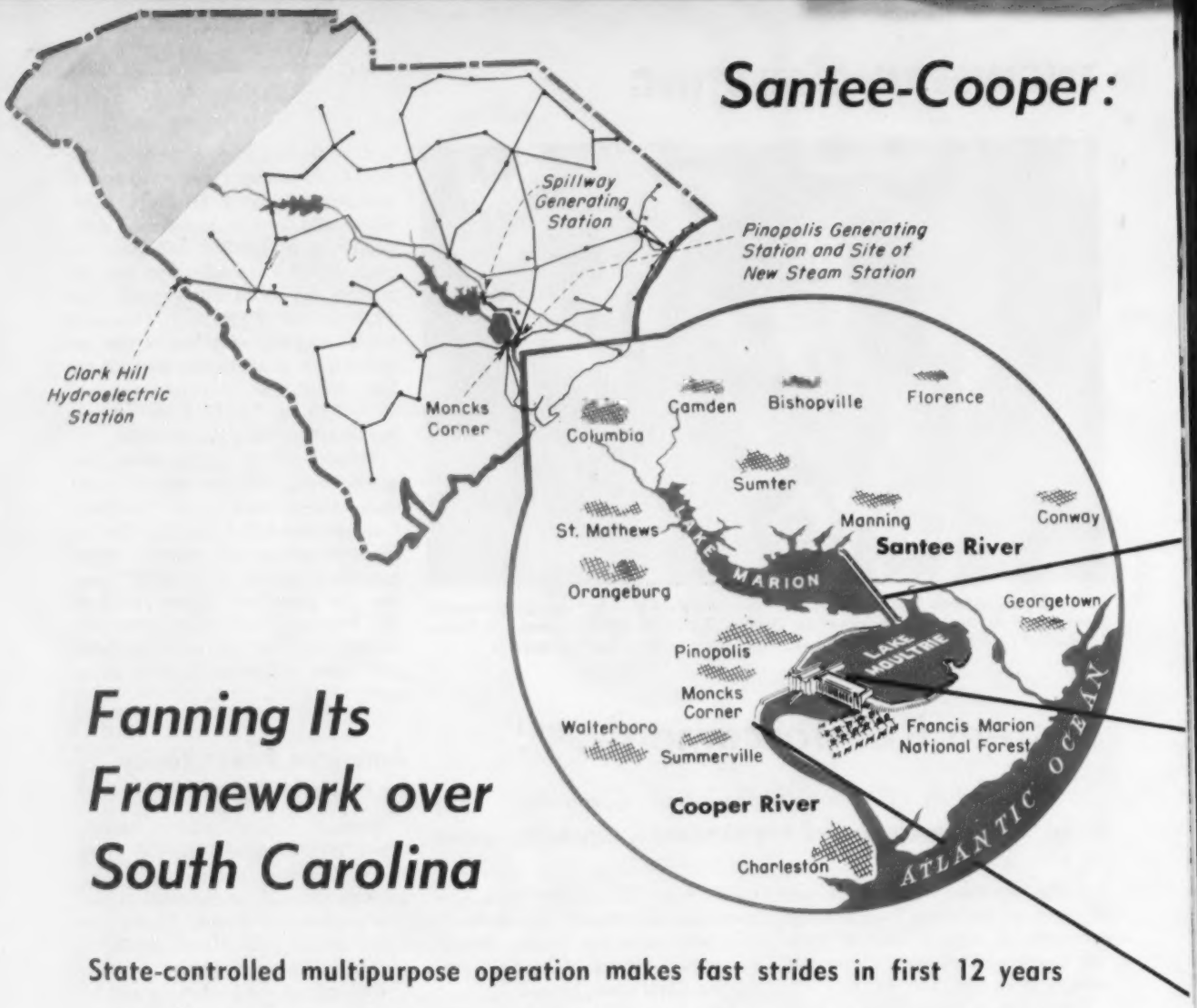
Nuclear energy, central station steam turbines, and industrial plant use of electricity are among the 22 subjects that will be discussed at this year's American Power Conference slated to be held March 24-26 at Sherman Hotel, Chicago.

Highlight of the conference will be addresses made by Interior Secretary Douglas McKay and C. H. Moses, board chairman of Arkansas Power & Light Co.

Technical program calls for the nuclear energy session to hold a discussion on the problems of nuclear power plant operation. This topic will be handled by R. L. Doan, manager of the Atomic Energy Division of Phillips Petroleum Co. Scheduled to be discussed at the Central Station Steam session are the trends in design of present-day steam turbines. Analysis of the trends will be made by Charles D. Wilson and Ellis P. Hansen, steam turbine engineers with Allis-Chalmers Manufacturing Co.

Planning and installing of an electrical system in a rapidly growing industrial plant will be discussed by Hans Edergger, Jr, L. L. Weldy & Associates, Chicago, and M. W. Steher, supervising industrial engineer of Wisconsin Electric Power Co.

Santee-Cooper:



Fanning Its Framework over South Carolina

State-controlled multipurpose operation makes fast strides in first 12 years

It isn't exactly a big business but in a dozen years of operation Santee-Cooper, the navigation, flood control, and power project of the South Carolina Public Service Authority, has made considerable headway. Led by General Manager Richard M. Jefferies, SCPSA officials propose continued expansion to give the state what they call "all the benefits of low-cost electric power." Parts of that program already include:

- First delivery during 1953 of about 12 million kwhr monthly generated by the multipurpose Clark Hill project on the Savannah River.
- Addition last fall of an 80,000-kw steam plant, bringing total SCPSA capacity to 215,000 kw.
- Construction of a 1,100-mile power loop to link 16 REA-financed distribution co-op members of the Central Electric Power Cooperative, served by SCPSA.

Widespread Need . . . SCPSA says that all these additions are needed, along with its existing 134,535 kw of hydro capacity, to meet the requirements of a power-hungry, rapidly growing industrial state. This demand, SCPSA feels, will require the resources of private and public power.

SCPSA and private utilities have worked together in the past on power supply and interchange, although through the years there have been many bitter legal battles. Last year SCPSA sold 102,981,000 kwhr to Carolina Power & Light, 135,735,000 kwhr to South Carolina Electric & Gas.

Over its early growing—usually legal—pains, SCPSA now owns the distribution system in Moncks Corner, home of its new $800,000 headquarters building, as well as those in eight other cities. It serves more than 12,500 retail customers, 16 wholesale customers, and the city of Georgetown, which closed its diesel plant operations.

In addition, the Authority is serving such heavy industries as Pittsburgh Metallurgical Co, which contracted for 26,000 kw of firm power last year, U. S. Air and Naval establishments in Charleston, Virginia-Carolina Chemical Co, and International Paper Co in Georgetown. In the future SCPSA expects to serve more municipals and a continuing influx of industries expected in the territory.

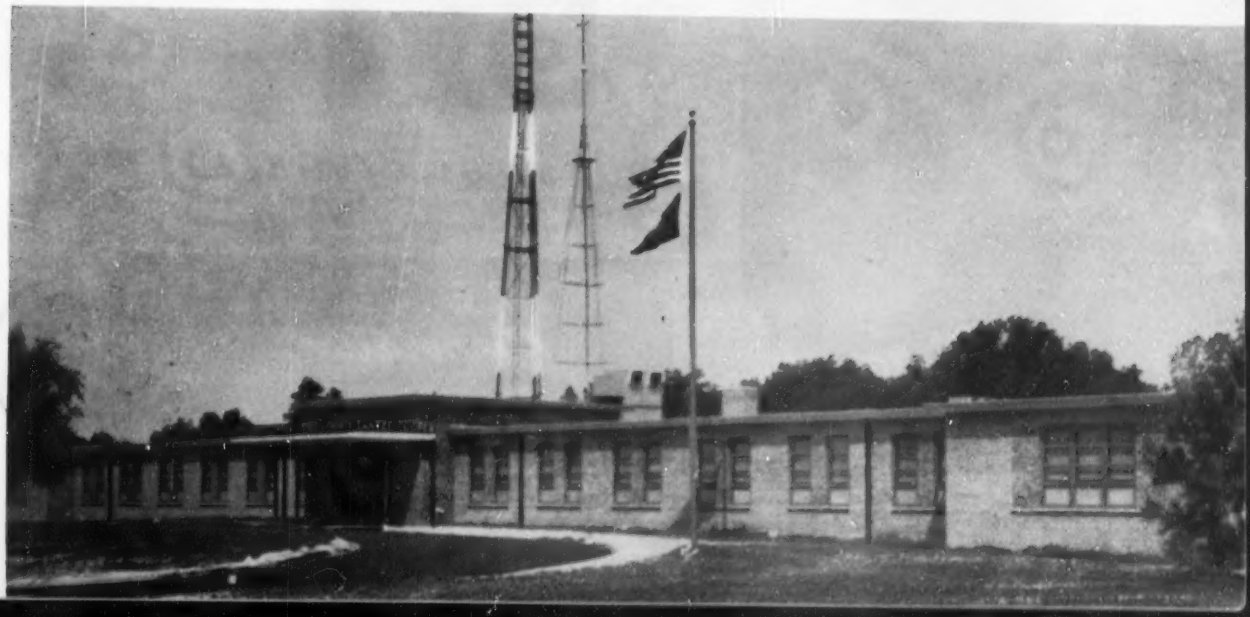
Large Usage . . . During the last fiscal year its retail customers used an average of 4,290 kwhr, about twice the national average of 2,175 kwhr. Average retail rate was 2.27¢ per kwhr, half a cent under national figure of 2.76¢.

During that time power output climbed to 682 million kwhr, up about 187 million over the previous fiscal year. The authority also purchased 155 million kwhr, almost

Santee Dam

Pinopolis
Steam Plant
& Hydro Dam

Headquarters
Building



Rome RoZone®

Superior Ozone-Resistant Insulation Deserves Your CONFIDENCE

What Ionization Testing of RoZone Means to You

Q: **What is ionization?**
A: Ionization is the electrical breakdown of air.

Q: **Where can ionization occur in electrical wires and cables?**
A: It can occur internally and externally unless preventative measures are taken.

Q: **What are the bad effects of ionization?**
A: a) Reduced dielectric strength.
b) Increased dielectric losses.
c) Possible reduced life.

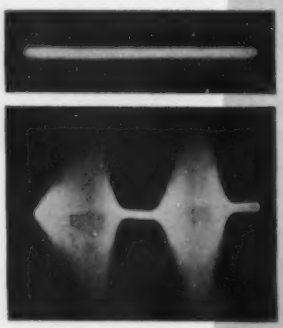
Q: **How can ionization be determined?**
A: By corona level measurements as described in AIEE Transactions, Volume 67, 1948. (A copy of this article will gladly be sent to you on request.)

Q: **How can you prevent ionization?**
A: By proper shielding methods and rigid manufacturing techniques and controls.

Every foot of RoZone insulated cable rated at 3,000 volts and over is subjected to ionization testing as a standard manufacturing control. This predetermination of cable behavior under actual service conditions assures you of uniform performance, as well as maximum freedom from the effects of ionization.

Here is another reason why Rome RoZone deserves your confidence. For complete information send for the Rome Power and Control Cable Catalog. It's yours for the asking.

500,000 CM stranded single conductor RoZone insulated, shielded, RoPrene sheathed power cable . . . 15,000 volts, grounded neutral.



The upper oscilloscope trace shows no ionization. Trace shown below indicates ionization point.

This specially designed instrument is used to test ionization level of cable just prior to shipment. *All* Rome RoZone insulated cable rated at more than 3000 volts is given this test.

It Costs Less to Buy the Best

RoZone is approved and accepted by leading utilities, industrials and consulting engineers

ROME CABLE
Corporation
ROME • NEW YORK
and
TORRANCE • CALIFORNIA

ROME CABLE ROME, N.Y.

Control room of the new Santee-Cooper steam plant, with an ultimate capacity of 300,000 kw

all of it coming from Clark Hill. The system's hourly demand reached a new high of 191,000 kw and an all-time system peak of 204,000 kw.

SCPSA is also on fairly firm financial ground. With assets of $87.7 million for the fiscal year ended June, 1953, it had outstanding only $43.9 in long term debt. At that time the state had an equity of $41.6 million in SCPSA: $34.4 million of it in U. S. government grants and the remainder in earned surplus.

From gross revenue of $4,613,313 during fiscal '53 the authority showed operating income of $1,495,272. Interest payments made ahead of schedule on bonded indebtedness totalled $1,130,153. Another $485,000 in bonds was retired, $801,152 was spent for plant addition, and $209,120 turned over to the state.

Long History . . . Greatly responsible for bringing SCPSA to its present strength has been 66-year-old General Manager Jefferies, a potent advocate of Santee-Cooper development since the 1920's. A former governor and state senator, he still remains a strong political figure. He has guided SCPSA through its legal battles and was around in 1934 when the state's General Assembly created SCPSA and empowered it to construct the Santee-Cooper project.

The modern story of SCPSA goes back to 1914 when the Santee-Cooper Development Co was formed by a Charleston group to develop power for a proposed trolley line from that city to Summerville. After it was found that the project would develop more power than was necessary, the property passed through several hands before International Land Co, a subsidiary of International Paper, bought it in 1928.

International revised the power potential of the development upwards and in 1933 received a go ahead for its plans from the Federal Power Commission. But hit by the depression, the firm was unable to carry through its proposal and put the property up for sale.

That's when the state stepped in. The project was taken over in October, 1933, as a public development and plans were forwarded to Washington.

After the legislature set up SCPSA, the federal government chimed in with a loan and grant in 1935. A long and bitter legal battle followed during which utilities in the state charged that the authority was unconstitutional. The losing battle held up start of the project until 1938. By February, 1942, the first turbine went into operation.

Wide Domain . . . It cost nearly $64 million to finance the Santee-Cooper multipurpose development of flood control, navigation, and power production. Of this, $23.2 was an outright federal grant, $29.5 million was a federal loan, and $11.3 million paid for clearing the reservoirs by the WPA.

Santee-Cooper is unique in that it is the first diversion in America of one river to another for navigation and power production. Holding Lake Marion in its boundaries (see page 17) is the Santee Dam, longest earthen dam in the world: 7.8 miles. It is 48 ft high and has 62 spillway gates, through which must pass a minimum of 500 cfs, into the Santee River. This water is utilized to generate power from a small 1,920 kw unit.

A diversion canal, 7.56 miles long, 200 ft wide at the bottom and 300 ft wide at the top, carries water to lower Lake Moultrie, formerly known as Pinopolis Reservoir. The lake contains 60,000 acres under water.

(*Continued on page* 50)

Conductor Bundling May End...

. . . on European transmission lines because of abrasion problem, speaker tells Pennsylvania Electric Association

Bundling of conductors will probably be discontinued on future European transmission lines because the conductors rotate in the wind and abrade each other at various places. On short-circuit tests the bundle conductors stiffen, pull unevenly and are damaged by the spacers. This was among the items cited by Eduard Fritz, Pennsylvania Water & Power Co, in reporting first-hand observation of European transmission practices to 150 members and guests at Baltimore meeting of Pennsylvania Electric Association's Transmission and Distribution Committee.

There are practically no wood-pole transmission lines on the continent, Fritz said, because wood is difficult to obtain and is expensive. Almost all distribution systems are in towns and cities and are mostly underground.

Pipe-filled concrete tower designs are in evidence and some tower weight savings are effected by other departures in design, he said.

Varying Conditions . . . Wind pressure and ice loads vary in different countries and according to plains, hill and mountainous regions, Fritz continued. He learned that broken wire forces are figured differently in several countries: Great Britain is about 5% greater than U. S. design values; Belgium is about the same as U. S. values; Italy, France, and Sweden use about 76%, 60%, and 39% of U. S. values.

In describing construction of the Shawville-Montebello 220-kv line, M. J. Fulton, Pennsylvania Electric Co, reported that inexperienced crews soon learned to erect one tower a day. Total cost of the 87-mile line was $47,370 per mile. Some individual cost items were: $45,000 for 36 miles of road construction mostly in mountain areas; approximately $550,000 for clearing about 1,300 acres; and $70,000 for chemical treatment on land not state owned.

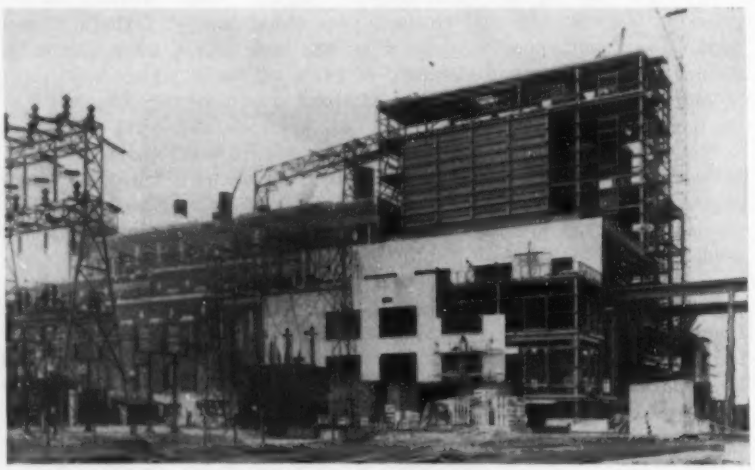
Baltimore's low-voltage ac network system covers approximately .8 square miles and has a load density of about 88,000 kva per square mile. Its average cost, according to J. J. Rueckert, Consolidated Gas Eletcric Light & Power Co, is $110 per kva load supplied, using a primary 13-kv bus and cables run in city-owned duct.

Power factor of the Baltimore network load was slightly less than 84% during the 1953 summer peak, Rueckert reported. Preliminary investigations indicate they could economically install up to 3 or 3.5 kvar of capacitors to effect a 1-kva reduction in load on network equipment.

Spacing Urged . . . If load densities of 15 to 20 kw per 100 ft are anticipated on an underground distribution system for a residential area, F. C. Van Wormer, General Electric Co recommended that spacing of transformers be limited to 300 ft. Most installations could then be made with a single secondary cable size, usually a No. 4 Awg and the load density could be served by a 50 kva transformer with a 150% maximum kva loading.

Proper care of hot line tools, according to O. G. Anderson, A. B. Chance Co, requires: Keeping tools clean and dry, never using a wet tool, protecting tools in transportation, inspecting all tools regularly, not trying to repair a broken tool, never exceeding manufacturers' ratings, and knowing the proper use for each tool.

F. Heller, Burndy Engineering Co, in explaining the use of moles (compressed pre-insulated bus bar arranged for round conductor taps) stated that it is advisable to have current flow in one side of the mold and out the opposite side, thus minimizing current flow from one end to the other.

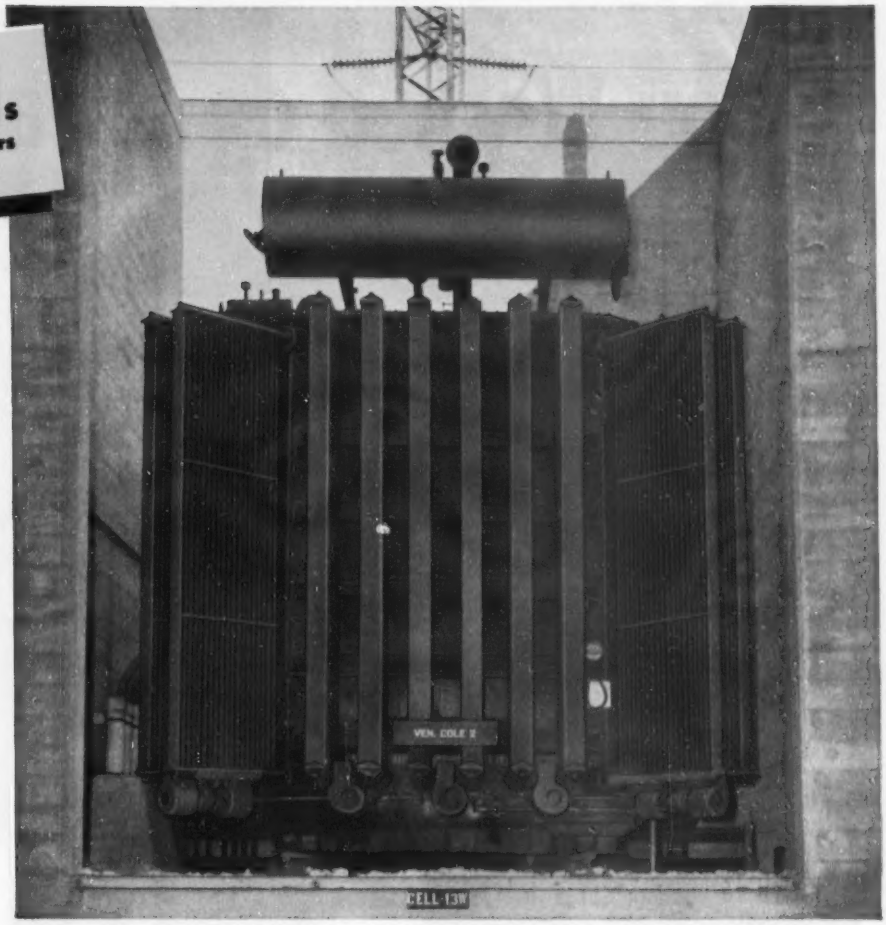


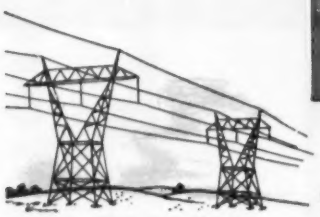
Work Starts on Jersey Central Addition

New 137,500-kw addition to Jersey Central Power & Light Co's Raritan River steam plant at Sayreville is going through the early stages of construction. The project costing $25 million is expected to be finished early in 1955. Raritan River Station now has a capacity of 100,000 kw.

Four Cyclone furnaces will fire the new boiler, capable of producing 990,000 lb of steam per hour (four hour maximum) at 2,075 psig at superheater outlet. Steam temperature at the superheater outlet will be 1,050 F and 1,000 F at reheater outlet.

Wagner
TRANSFORMERS
...the choice of leaders in industry





...to fulfill an obligation

Vast supplies of electric energy are ready to work for you—at any hour—at the touch of a switch. This fact proves how well the electric utilities have fulfilled their self-imposed obligation that there must always be power. Their job is tough, because the ever-increasing demand for electricity (a possible 400,000,000,000 kilowatt-hours this year) taxes facilities to the utmost.

That's why the Union Electric Company of Missouri, for example, uses only the most dependable equipment—like this Wagner Power Transformer—one of many installed at their Venice, Illinois plant.

Wagner Power Transformers have been serving the power industry dependably for over sixty years. Service records from the field, dating back to the early days, prove their ability to give continuous service over unusually long periods of time. They are compact in design and have inherent strength and stability. They have sufficient capacity to not only carry their normal load, but to be able to handle overloads—again and again—whenever emergencies arise.

Wagner engineers are qualified to specify the correct transformer for *your* requirements as well. Consult the nearest of our 32 branch offices or write to

Wagner Electric Corporation EST. 1891

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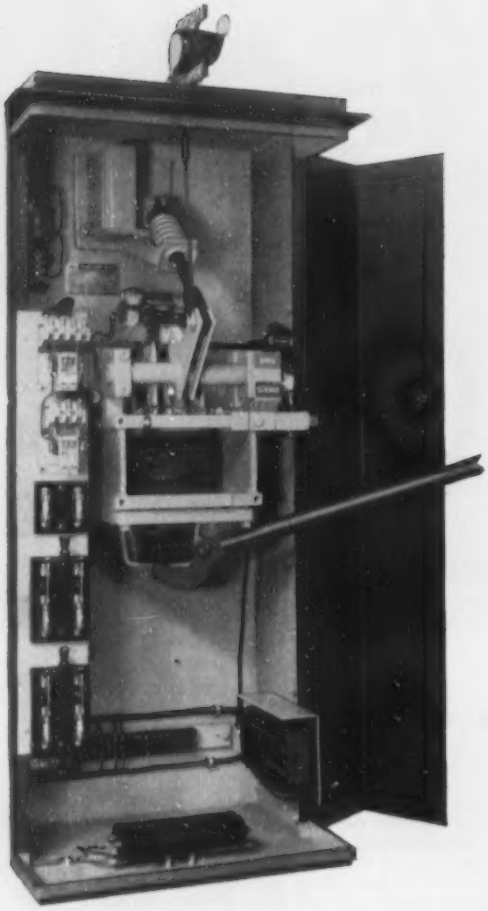
WT52-7

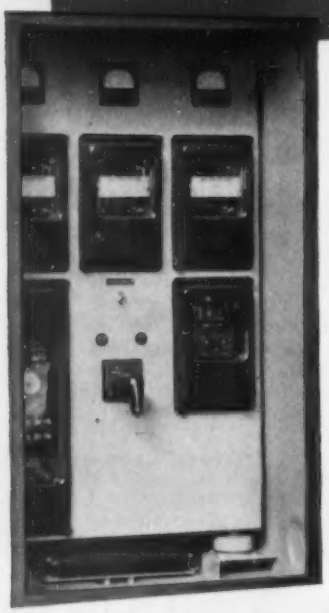
If You Worked on Breakers...

this is the breaker you'd buy!

The minute you open the operating cabinet you have the story. Clean design! Everything you ever wanted to get at for any reason is right out in the open. Check a few of the many features of this outstanding breaker, then GET COMPLETE INFORMATION! Call your nearby A-C district office, or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-4252



ROOMY OPERATOR CABINET. Access to operator is unrestricted. Operator is high speed solenoid type — mechanically and electrically trip-free. Side hinging of L-shaped doors allows access to operator cabinet from three sides. Only 7 inches of clearance needed in front of cabinet to open doors.

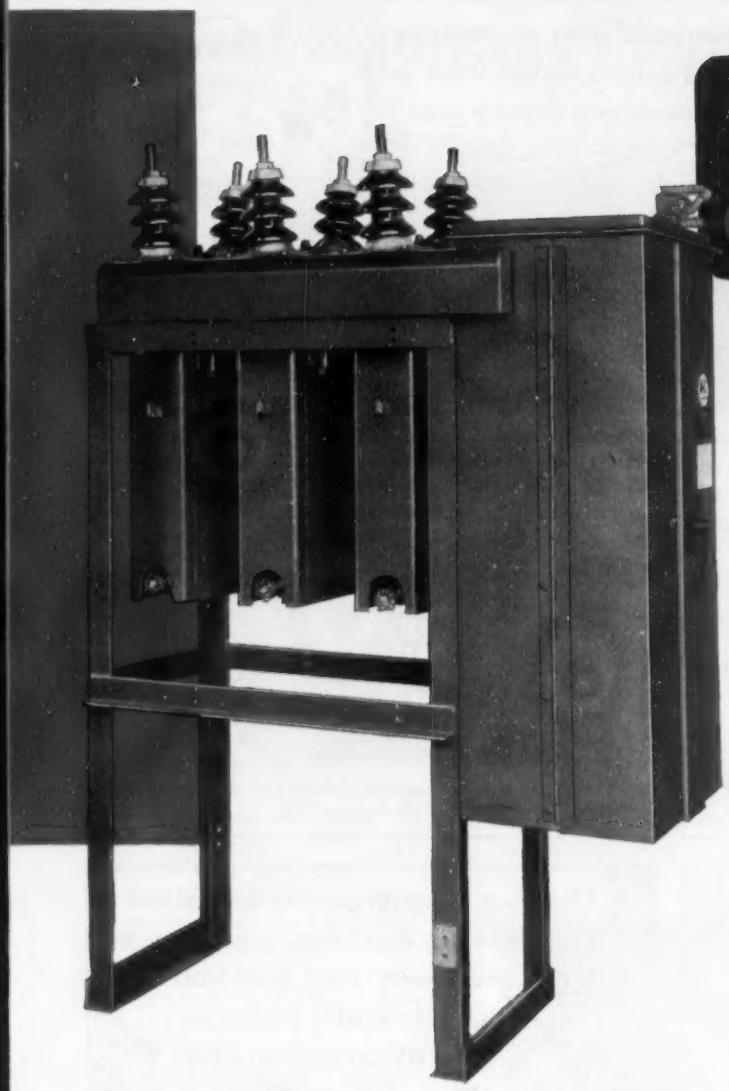


RELAY CABINET. Relays when specified are in separate cabinet, which can be secured against unauthorized personnel. Relay panel is fixed. This eliminates troublesome hinge wiring. Door at rear provides access to back of relays. Panel is shock-mounted at four points so relay contacts are not operated accidentally by breaker vibration or slamming of cabinet door.

A-C ALLIS-CHALMERS

ALLIS-

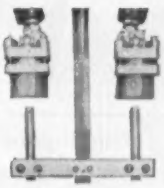
ALLIS-CHALMERS
14.4-kv
Oil Circuit Breakers



TANK-PER-PHASE construction — as used in large breakers — has high safety factor. It completely isolates phases and eliminates possibility of internal phase-to-phase flashover. A maximum of 12 gallons of oil in each tank makes it a simple matter to raise and lower tanks.

VISIBILITY PLUS — external position indicator easily visible at a distance from front or side. Contact position indicator also provided inside. In addition, maintenance closing device is side operated. Man closing breaker can observe contacts and man working on them.

DOUBLE BREAK per phase principle is used with time-proved *Ruptor* interrupting devices. Self-wiping, self-aligning tulip and bayonet contacts are used. Here again, Allis-Chalmers provides the same quality construction as is used on large A-C breakers.



NO BURIED LEADS. No more conduits, pipes and fittings! To get at bushing current transformer leads, simply remove 3 pins at bottom of fabricated wiring duct and remove bottom plate. This is typical of the well-engineered features that make this breaker outstanding in its field.

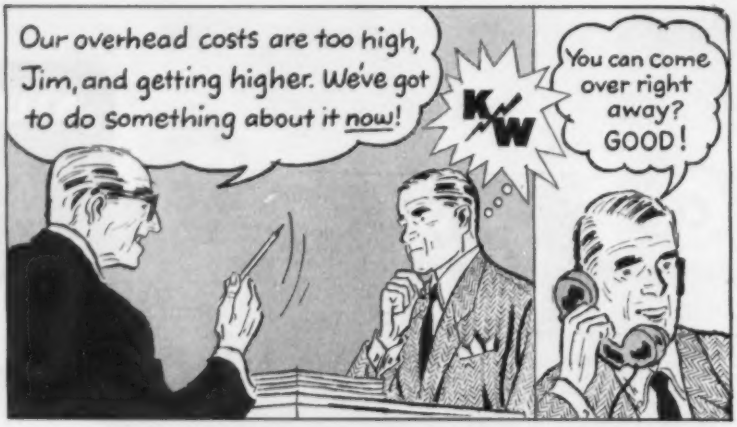
BREAKER RATINGS (8-Cycle Standard Interrupting Time)

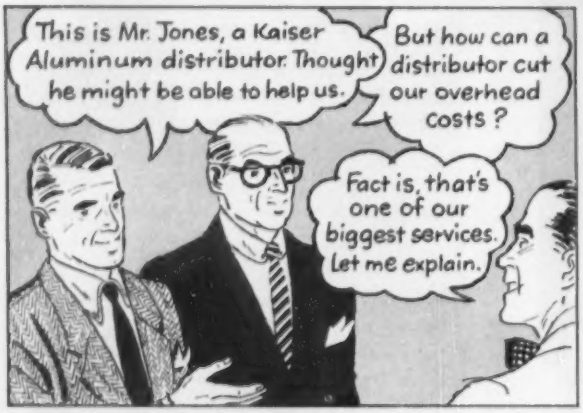
Type	Rated Kv	Rated Amps	INTERRUPTING RATING RMS TOTAL AMPERES At Rated Volts	Maximum Rating	Kva	Weight of Breaker With Oil (lbs)
OZ-15-100	14.4	600	4,000	15,000	100,000	2,350
OZ-15-250	14.4	600	10,000	25,000	250,000	2,370
OZ-15-250	14.4	1200	10,000	25,000	250,000	2,470
OZ-23-250	23	600	6,300	12,000	250,000	2,370

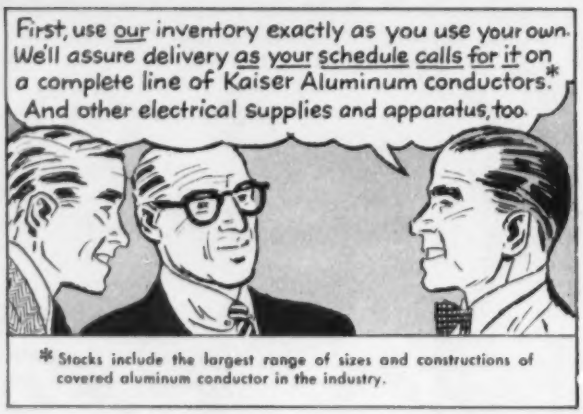
Ruptor is an Allis-Chalmers trademark.

CHALMERS

"Can't we cut overhead costs?"

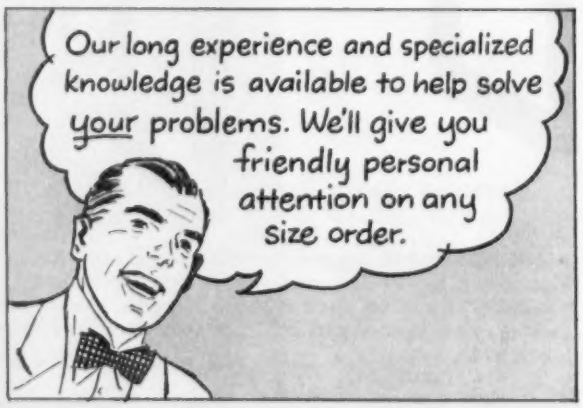

Our overhead costs are too high, Jim, and getting higher. We've got to do something about it now!
You can come over right away? GOOD!


This is Mr. Jones, a Kaiser Aluminum distributor. Thought he might be able to help us.
But how can a distributor cut our overhead costs?
Fact is, that's one of our biggest services. Let me explain.


First, use our inventory exactly as you use your own. We'll assure delivery as your schedule calls for it on a complete line of Kaiser Aluminum conductors.* And other electrical supplies and apparatus, too.

* Stocks include the largest range of sizes and constructions of covered aluminum conductor in the industry.

This means you can reduce your storage space to a minimum. Less storage space... Less overhead...and lower costs for you!
Makes sense, Jim. Let's take advantage of our Kaiser Aluminum Distributor from now on!

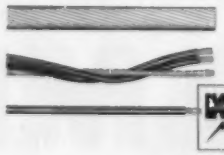

Our long experience and specialized knowledge is available to help solve your problems. We'll give you friendly personal attention on any size order.

KAISER ALUMINUM DISTRIBUTORS CONVENIENTLY LOCATED TO SERVE YOU:

Line Material Co.
General Electric Supply Co.
Westinghouse Electric Supply Co.
Capital Electric Supply
Central Electric Supply Co., Inc.
Champion, Inc.
City Electric Distributors, Inc.
Corpus Christi Hardware Co., Inc.
Crescent Electric Supply Co.
Dauphin Electrical Supplies
Dutton-Lainson Co.
Electrical & Mechanical Supply Corp.
Eoff Electric Co.
Evans Electrical Supply, Inc.
Florida Electric Supply, Inc.
George H. Wahn Co.
Hampden Electric Supply Co.
Hunzicker Brothers
Interstate Electric Co. of Shreveport, Inc.
Mack Electric Supply Co.
Maydwell & Hartzell, Inc.
Nelson Electric Supply Co.
Price Electric Co.
Russell Belden Electric Co.
S. M. Supply Co., Inc.
Southern Minnesota Supply Co.
Stuart C. Irby Co.
Stubbs Electric Co.
Tafel Electric & Supply Co.
The Korsmeyer Co.
Virginian Electric, Inc.
Waltrip Electric Co.

GET IN TOUCH with your nearby Kaiser Aluminum distributor *now*. He makes available top-notch engineering services, including the famed Field, Engineering and Laboratory services of Kaiser Aluminum. Refer to the list at the left and your local telephone directory. Kaiser Aluminum & Chemical Sales, Inc., Oakland 12, California.

Kaiser Aluminum



The Nation's Largest Supplier of Aluminum Weatherproof Conductor and Triplex

Power Agencies Plentiful in Northwest

- **Many of the organizations devoted to solving the region's energy problems have common goals and interlocking memberships**
- **In line with partnership principle, several of the groups are offering to build projects if federal aid is granted for non-power features**

If all the organizations devoted to solving the power problems of the Pacific Northwest were piled one atop the other, in the right place, the area would have a substantial start toward one of the new dams it admittedly needs to avoid a power shortage after the next five years or so.

As if such older groups as the Columbia Basin Interagency Committee, the Columbia Interstate Compact Commission and the Pacific Northwest Utilities Conference Committee were not enough—and most authorities agree they are not enough—the past few months have seen the formation of the Pacific Northwest Governors' Power Policy Committee and the Washington State Power Commission. Continuing the organizational process even farther down into the "grass roots," a group of PUDs and municipalities has petitioned the Washington State Power Commission for permission to form Washington State Operating Agency No. 1.

Nor need one stop there. The list easily can be lengthened by addition of such groups as the Northwest Public Power Assn., the Northwest Power Pool, the Intercompany Power Pool and the National Hells Canyon Assn.

Many of these groups have some common goals and inter-locking memberships, even arranging their meetings for mutual convenience. The Governors Power Policy Committee and the Compact Commission, for example, recently met on successive days at Boise, Idaho.

To distinguish among these many organizations, here are some points to remember:

The **Columbia Basin Interagency Committee,** one of the oldest, is comprised of representatives of federal agencies in the area and governors of the various states. It has served as an advisory group for the Bonneville Power Administration and is losing its influence to the same degree that BPA is diminishing in importance. Its list of projects available for future construction is a valuable piece of reference material, however.

The **Columbia Interstate Compact Commission** was organized several years ago to write a compact covering apportionment of the water resources of the Columbia River and its tributaries among the states of Washington, Oregon, Idaho, Montana, Wyoming, Utah and Nevada. Membership from the various states is designated in accord with legislative provisions. The commission at first sought to avoid the power problem in its considerations but now is taking it up, rather reluctantly. The compact arrangement is regarded as the "states' rights" answer to the Columbia Valley Authority proposed in the days of the New Deal. Most observers feel at least 10 years will be required to reach agreement on a compact, although some commission members hope to be able to present some sort of an agreement to the 1955 sessions of their legislatures. Frank Banks, formerly with the Bureau of Reclamation, heads the commission, with H. Calvert Anderson as its executive secretary. Headquarters are in Spokane.

The **Pacific Northwest Governors' Power Policy Committee** is not as broad as the Compact Commission, either in geography or scope. Organized in December by the governors of

PRELIMINARY WORK on drafting of a proposed interstate water compact is done by Frederick L. Zimmermann (left), New York, advisor to the Columbia Interstate Compact Commission and Mark R. Kulp (right), Idaho state reclamation engineer. Zimmermann and an associate, Mitchell Wendell, have been asked by the commission to complete by this month a draft of the proposed compact controlling the waters of the Columbia River and its tributaries. Commission hopes to have final proposal ready for consideration of seven state legislatures by 1955 after interested parties have had an opportunity to consider and comment on the draft

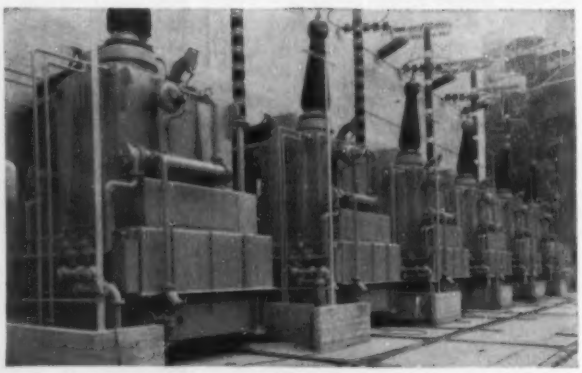
WHERE is this 230 kv Pennsylvania Transformer going?

The snow and tall fir trees in the background of the top photograph are two substantial clues that this transformer is headed for the Great Northwest. Further study of the picture will reveal that the transformer is *traveling in an upright position* and is *completely assembled* except for bushings and forced-cooling equipment.

When a large power transformer arrives at its installation site in this manner, ordinary rigging methods can be used to move the transformer from the drop center railway car to the foundation pad. Time and money will be saved in this operation — especially in remote places where special or heavy rigging equipment is not readily available.

Furthermore, the problem of putting a transformer into service is greatly simplified when it arrives at its destination completely assembled and in a one-piece tank. That was how the six transformers in these two 87,000 Kva banks reached the Great Northwest.

Prior to shipment, the covers were welded shut and the units gas-filled to keep the interiors of the transformers dry for their trip across the country. When the bushings, heat exchangers, and accessories were assembled, the transformers were ready for operation.



Contour-design, shell-form power transformers, such as these 230 Kv, 29,000 Kva units, can be designed and built by Pennsylvania in sizes up to 300,000 Kva and in voltages up to 330 Kv.

PENNSYLVANIA TRANSFORMER COMPANY

A McGraw Electric Company Division • **CANONSBURG, PENNSYLVANIA** • *Greater Pittsburgh District*

Idaho, Oregon, Washington and Montana to give force to President Eisenhower's "partnership" policy, it is expected to be most helpful in determining "the causes of conflict where local opposition prevents construction of projects needed for regional power supply, and to encourage local groups to resolve these problems within their own fields in the interest of their contribution to regional economic development and their own share of benefits from such development." It includes, besides the governors themselves, representatives of federal agencies, all members of the Northwest Power Pool, and delegates from the British Columbia provincial government and the Compact Commission.

Budget Adopted

At its meeting last month in Portland, Ore., the Governors' Committee adopted a budget of $40,000, to be met by equal contributions from private utilities and from the states and other interested agencies. The funds will cover costs of a permanent engineering staff. The committee called for submission by May 1 of an engineering study on ten-year power needs and potential new power sources. The group also voted to make Portland its headquarters for the first six months of 1954. Thereafter it would be shifted to Spokane, Wash., unless a decision is made otherwise.

Other organizations operating across state lines, in addition to the Interagency Committee, the Compact Commission and the Governors' Committee, are the following:

Pacific Northwest Utilities Conference Committee, composed of the policy-making heads of members of utilities in the Northwest Power Pool, with C. A. Erdahl of Tacoma, Wash., as chairman. It has sought to focus Congressional attention on the area's need for additional generation.

Northwest Public Power Assn., composed of public power utilities, with Gus Norwood of Vancouver, Wash., as executive secretary.

Intercompany Power Pool, composed of five private utilities in the area, concerning itself with operational problems.

National Hells Canyon Assn., organized by labor and the Grange to fight the Idaho Power Co plan to build low dams on the Snake River.

Hells Canyon campaigning on the local level is handled by the Idaho-Oregon-Washington Hells Canyon Assn., commonly referred to as Tri-State.

Construction Agency?

Fine though such groups as the Compact Commission, the Governors' Committee and the Interagency Committee may be, no one expects them actually to get into the business of building dams. They may be valuable in determining the needs for additional generation, establishing construction schedules and reconciling conflicting interests, but construction is out of their line.

Washington, most populous state in the area, has an agency which might do some construction, however. That is the Washington State Power Commission, authorized by the 1953 state legislature and activated last fall by Gov. Arthur B. Langlie. Its managing director, since Feb. 1, is J. Frank Ward, formerly superintendent of Tacoma City Light, who expects before the year is out to recommend projects that his commission can carry out. Such projects might possibly include steam plants, which could be placed into operation before construction could be completed on a large hydroelectric project.

The commission has the authority not only to "develop and integrate such resources as necessary whenever public utilities other than those owned by the United States and its agencies are not in a position so to do" but also to "join with Canada, the United States, the states thereof, and their agencies to develop and integrate the water resources of the region." Governor Langlie has made it clear the commission will speak for him in the Governors' Power Policy Committee.

Aims at Filling Gap

Until creation of the state power commission, projects too big for an individual municipality, PUD or private power company to finance could be constructed only by the federal government. There was no intermediate agency and now, with the federal government apparently going out of the power business, there is no higher authority. The commission promises to fulfill, at least within the state, the function formerly reserved to the federal government, although legality of its legislation still must be tested.

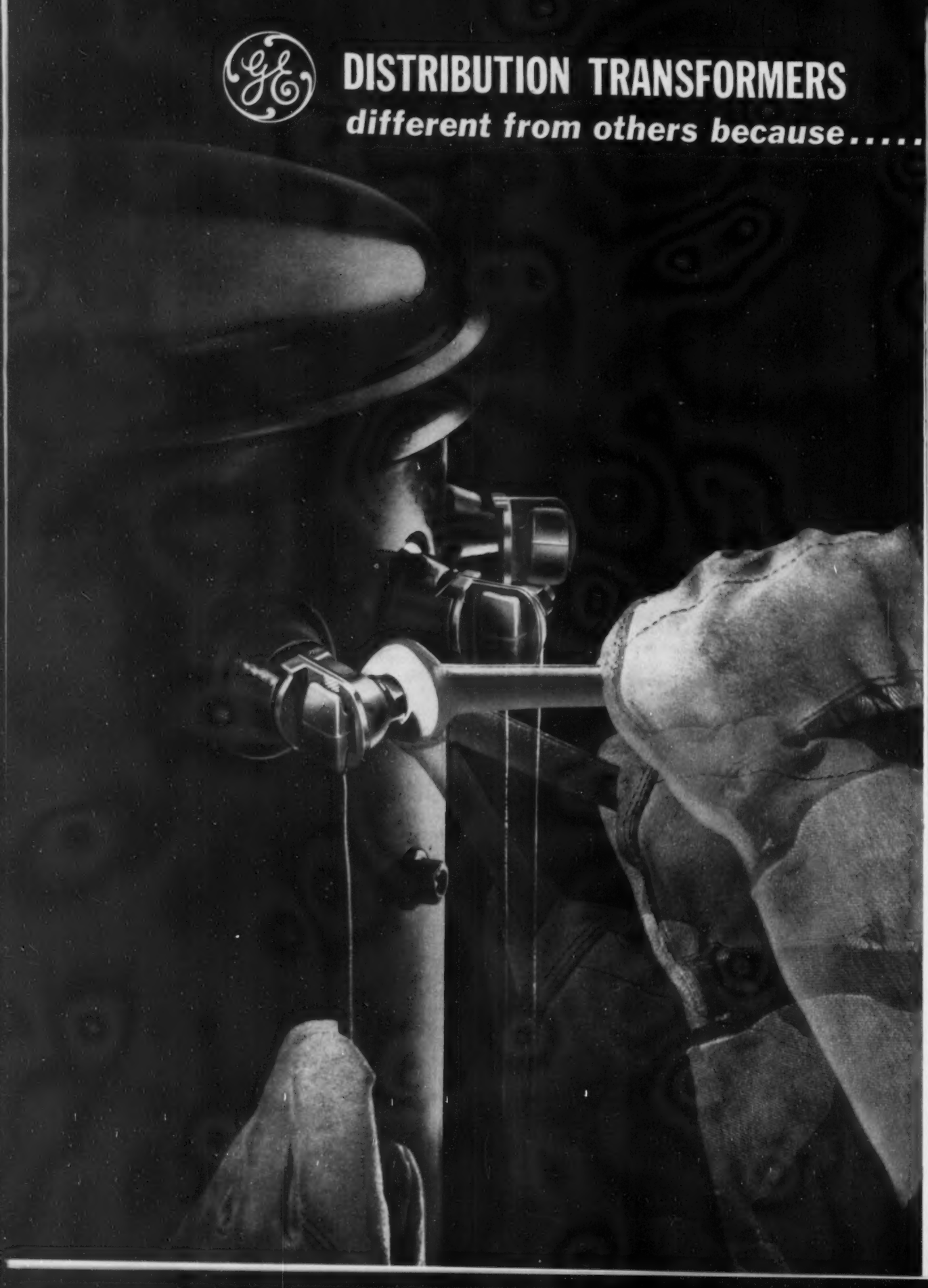
The municipalities of Seattle and Tacoma have the financial ability individually to construct projects in the $100 million classification but most of the remaining hydroelectric sites on the Columbia River system cost in the neighborhood of $200 million—presumably too much for any single agency in the state to finance. The state power commission, by its authority to negotiate contracts with any PUD or city of the state "for the lease, purchase, construction and operation of electric generating and transmission plants and facilities . . . and for the marketing of the energy produced," feels itself adequate to construct dams even on the main stem of the Columbia, provided the federal government bears the cost of such non-reimbursable items as flood control, navigation and recreation.

New Operating Group

The State Power Commission may not be the end of the line organizationally, however. A number of PUDs and smaller municipalities have petitioned the commission for organization of Washington State Operating Agency No. 1, which would enjoy many of the powers granted to the commission. Some observers believe, in fact, that organizers of the proposed agency are attempting to assume the functions intended for the commission. Action on the petition is scheduled for March.

Although most of the groups named in this article are committed to work under the federal government's partnership policy, no one in the area expects this policy to bear fruit, in the form of additional generation, before 1965. Until then, additional generation will have to be provided by individual utilities, outside the partnership arrangement.

An informal organization may be the first to get into action as far as partnership construction goes—the association of five private utilities which in mid-December applied to FPC for permission to investigate hydro possibilities on two sites on Clearwater River tributaries in Idaho, Bruces Eddy and Penny Cliffs. Joined in this venture are Portland General Electric, Pacific Power & Light, Washington Water Power, Montana Power and Mountain States Power companies.


DISTRIBUTION TRANSFORMERS
different from others because.....

.....Strenicor pressure terminal clamps.....

minimize breakage due to stress-corrosion

Months or even years after installation, the strain imposed by tight connections may cause breakage of secondary terminals due to stress-corrosion (season cracking). This causes outages, service calls and customer inconvenience.

METALLURGICAL STUDIES of the causes of stress-corrosion led to the development of Strenicor—a new copper-nickel-silicon alloy. After successive solution and aging heat treatments, this alloy provides a high tensile strength of 107,000 psi—a yield strength of 83,000 psi. Thus General Electric Spirakore* transformers with Strenicor secondary terminals are practically immune to failure by stress-corrosion.

*Registered Trade-mark of General Electric Co.

REMEMBER . . . all transformers are not alike . . . compare the General Electric plus features in the chart below and see for yourself.

For more information on distribution transformers, either unit-type or conventional, contact your nearest G-E sales office, agent or distributor, or write to General Electric Company, Section 431-7, Schenectady 5, New York.

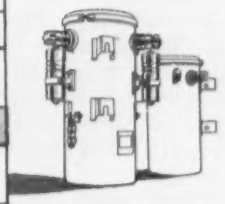
You can put your confidence in—

GENERAL ELECTRIC

ALL TRANSFORMERS ARE NOT ALIKE

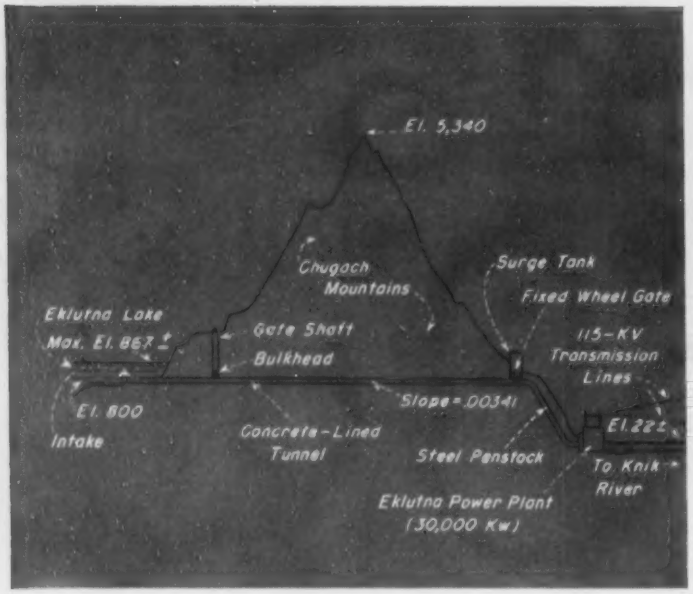
(make this simple comparison and see)

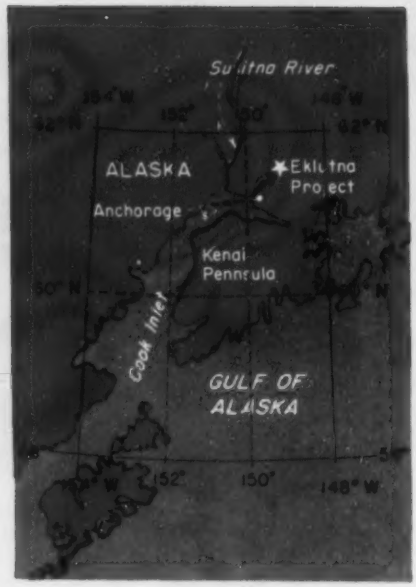
FEATURE	General Electric	Mfr. A	Mfr. B	Mfr. C	Mfr. D	Mfr. E
Production-line impulse testing	YES	NO	NO	NO	NO	NO
Nitrile rubber gaskets at all tank openings	YES	NO	NO	NO	NO	NO
Strenicor pressure terminal clamps	YES	NO	NO	NO	NO	NO
Insulated clamp-type connectors on tank wall hv bushings	YES	YES	YES	NO	YES	YES
One-piece cover band	YES	NO	NO	NO	NO	YES
Terminals designed for both copper and aluminum conductors	YES	NO	NO	NO	NO	NO
Gapped valve-type arresters	YES	NO	NO	NO	NO	NO
Nationwide company-operated service facilities	YES	YES	NO	NO	NO	YES



UNIT-TYPE CONVENTIONAL

"Take your choice G. E. makes both"





Tunneling through a mountain in Alaska costs time and money. That's why U. S. Bureau of Reclamation found . . .

Eklutna Project Two Ways Tough

November will see first power delivered from a hydro project in Alaska that has turned out to be rough, both politically and physically. The project is Eklutna, on the Glenn Highway 34 miles northeast of Anchorage. It takes water from Eklutna Lake 4½ miles through the Chugach Mountains to two 16,667-kva generators. The plant will supply the City of Anchorage, Chugach Electric Association and Matanuska Electric Association.

All this costs money—an estimated $33 million of it—and that's where the going got politically rough. Back in 1952 the House Interior Committee set a limit of $20,365,000 on the project. It discovered USBR had spent $3 million above that amount when Reclamation officials sought to have the authorization raised to $35 million. After much wrangling, Congress went along with the $33 million figure.

Couple of Cave-ins . . . The project, meanwhile, had got physically rough. In July of '52 the tunnel face sloughed in, filling the tunnel heading with muck and letting water flow in at the rate of 3 million gallons a minute. Construction was halted temporarily until the water pocket drained. Then in November the tunnel caved in 50 ft back of the heading and stopped all progress for about two months. To top troubles off, an explosion injured 17 men working on the project.

But contractors got a break toward the end of the tunneling work. Final geological conditions were found to be better than expected, and the excavation, started from both ends at once, was holed through last October, exactly on schedule.

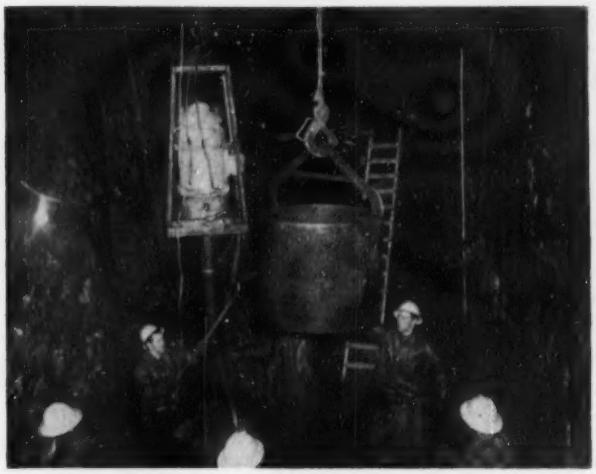
For construction purposes the tunnel was divided into three sections: the intake structure which is submerged under Eklutna Lake, the tunnel proper including the gate shaft and surge tank, and the penstock.

Construction of the tunnel proper was carried on from two headings. On the Eklutna Lake side, a shaft was sunk at the gate shaft location, and the tunnel was initially driven toward the north shore of Eklutna Lake. Here temporary bulkheads were installed, and this section of the tunnel was lined with concrete. Excavation of the tunnel was then continued from the gate shaft northward toward the power plant. For the north heading, an adit was driven to intersect the tunnel centerline at a point on the hillside just south of the surge tank location. The tunnel was then driven southward toward the Eklutna Lake heading and northward for surge tank excavation and connection with the penstock tunnel.

Inward and Upward . . . The penstock tunnel was excavated from a drift in the hillside adjacent to the powerhouse. After about 400 feet of approximately horizontal excavation, with an upward slope of 0.34%, the penstock was driven upward at a 53° angle to the junction with the tunnel proper. The penstock is being lined with a single steel penstock tube backed by concrete, reducing from 90 inches inside diameter at the surge tank to 72 inches at the wye-branch junction where the penstock proper divides into two 51-inch tubes for the two 25,000-hp turbines. Total length of the penstock to the wye branch is 1,463 feet, with 693 feet penstock drop over 1,120 feet of horizontal distance.

The underwater inlet structure was constructed by submerged dredging and diving operations from Eklutna Lake.

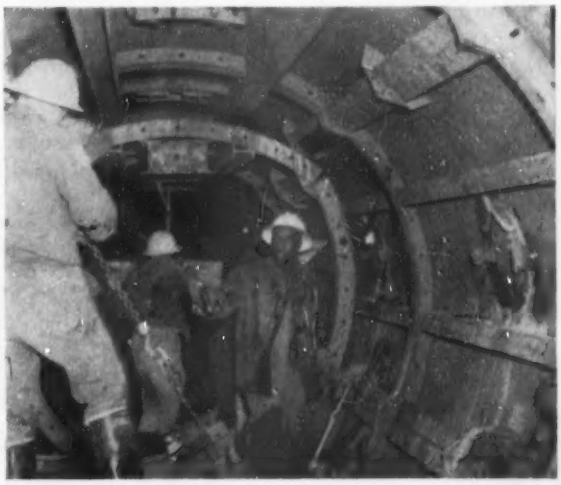
EKLUTNA PROJECT'S intake structure was excavated by dredge in Eklutna Lake. Pontoon discharge line can be seen at left



BUCKET is lowered for "mucking out" sump at bottom of gate shaft. Tunnel lining operations were initiated during January of this year

HOLING-THROUGH blast is set off by Chief Engineer McClellan of USBR as other Reclamation officials and project manager look on

WORKMEN in the south tunnel get 32-ft section of steel form ready for moving into place. Tunnel work was slowed by two cave-ins



An 8-inch suction dredge with cutter head, floating in the lake, carried on the excavation which was continued downstream until junction was made with the temporary bulkheads. Precast concrete pipe tunnel inlet sections were lowered into place and coupled by divers to the lined tunnel section which had been uncovered by the dredging operators. The transition, inlet structure and trashracks, which were fabricated on the job, were then coupled to the precast inlet section. Backfilling was completed by dredging operations.

Tunnel lining operations were initiated during January of this year by starting concrete placing near the gate shaft. Heated aggregates are transported into the tunnel in muck cars to the concrete mixer and pumpcrete machine from a batching plant located at the north portal.

With Eklutna coming along well now, the Anchorage area can look forward to a better winter than they've just seen. Once the two units come on the line. the area will get 137 million kwhr firm and 20 million secondary power annually.

Kearny Station . . .

. . . discussed at meeting of Pennsylvania Electric Association's Prive Movers Committee

"Never a dull moment" is the way E. H. Snyder characterized the activities of the utility manager in keeping up with demands for generating capacity on a system like that of Public Service Electric & Gas. He, as manager of the electric department, was talking to the Prime Movers Committee of Pennsylvania Electric Association and cited the new 290 Mw station at Kearny as just one partially completed step in meeting a 1965 demand of 2,500 Mw and a 1975 demand of 5,000 Mw on a system now experiencing 1,712 Mw. System philosophy, he said, was to work materials as hard as justified and that resulted in the 2,350 psi/1100 F/1050 F cycle for the tandem-compound machines. The 145 Mw units were the largest available at 3600 rpm. Designed thermal performance is 8,920 Btu per kwhr and, Snyder noted, this should save 400,000 tons of coal against the attainment of the section initiated in 1925.

Boiler Operation . . . Pressurized operation of the twin furnace controlled-circulation boilers was met, said E. E. Powell, Combustion Engineering, Inc, by welding the water-wall tubes into platens with narrow spaces between tubes. The casing need not be tight and no refractory is needed, he pointed out. Four pounds of water are circulated for each pound of steam generated.

All high-pressure steam is confined to the high pressure turbine and the intercept valves are subjected to reduced temperature by installing 3 reheat blade rings in the HP unit. C. W. Elston, General Electric Co, added that this was his company's first venture into steam sealing for this rating. Inability so far to hit the stated efficiency was apparently due to interstage leakage.

Height Reduction . . . Side exhausts into paired condensers reduced overall height by 11 ft and saved some $300,000 according to R. A. Baker, assistant to Public Service E&G mechanical engineer. Half-size is the ruling rating for the tandem feed pumps, FD and ID fans and gas recirculating fans with a fifth feed pump as a spare for both units. Contractors take all the flyash that has been recharged to the wet-bottom furnace for agglomeration into granular form, he reported.

Break-in problems for the first Kearny unit involved several outages and puzzling behaviors between March and November of 1953 and Senior Engineer H. E. Carpenter, traced these to several sectors of the cycle. Utilization of the condensate for heat pick-up and cooling is unusually comprehensive, he said, and the ramifications led to boiler feed water leaking over into the condensate system. Boiler feed pumps as well as maintaining drum level have the burden of supplying injection sealing water for the boiler circulators. The two functions are not readily reconciled and Carpenter said some of the circulator problems are still to be solved. Roller trunnions in the bowl pulverizers froze at times and when they released, a burst of fines through the burners would send the load up only to drop later. The seesawing was a puzzler until the cause was discovered.

Insurance Protection . . . Closer liaison between plant engineers and utility insurance staffs was indicated in a symposium on four pertinent forms of protection and coverage. Policy as to coverage was revealed as varying from complete and extended fire, with loss of use of equipment, pressure vessel rupture and public liability to a very minimum of coverage by a company large and diversified enough to carry all but catastrophic risk.

Farm Electrification Award Presented

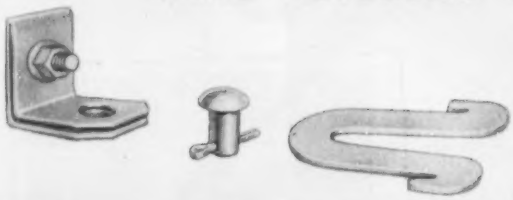
First Merit Award of Connecticut Farm Electrification Council is presented to David A. Clarke (left), executive secretary of Connecticut State Farm Bureau Federation, by R. H. Knowlton, chairman of the board of Connecticut Light & Power Co. Sitting at right is Col H. S. Bennion, vice president and managing director of Edison Electric Institute.

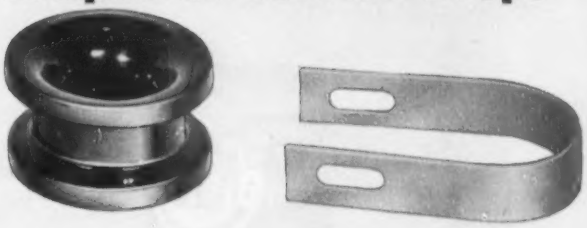
Clarke received the award in recognition of his outstanding contributions in helping to bring about the nearly 100% electrification of Connecticut's farms. Presentation was made at New England Electrification Institute conference held last month at University of Connecticut.

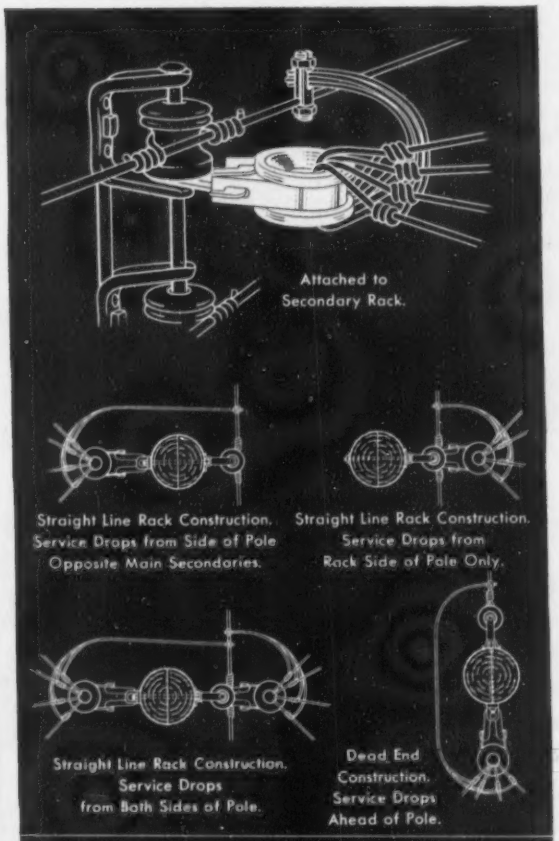
LINE CONSTRUCTION BLUEPRINTS

HOW SOME UTILITIES ARE MAKING CONSTRUCTION WORK EASIER . . .
IN WAYS THAT MAY BE HELPFUL AND USEFUL TO YOU.

L-M's Versatile Take-Off Insulator Simplifies Service Drops





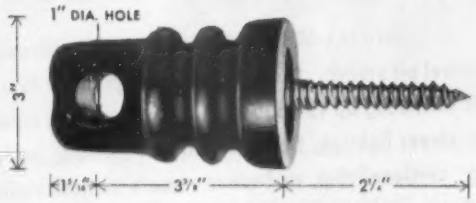

Attached to Secondary Rack.
Straight Line Rack Construction. Service Drops from Side of Pole Opposite Main Secondaries.
Straight Line Rack Construction. Service Drops from Rack Side of Pole Only.
Straight Line Rack Construction. Service Drops from Both Sides of Pole.
Dead End Construction. Service Drops Ahead of Pole.

With the L-M Take-Off Insulator, it's much easier to install service drops. The Take-Off eliminates overloading of secondary rack spools and tangled connections. May be attached to secondary racks or directly to the pole. Simplifies installing, replacing, removing, or changing service drops; simplifies the operation when main conductors are replaced.

Easily used on either old or new construction. On old construction the yoke is just slipped under the rack spool, band is placed around insulator and snapped onto the yoke. Then service wires are transferred to the porcelain ring. Blueprints at left and below show some suggested uses.

Steel parts are heavily galvanized. Wet-process porcelain insulator has a 4" outside diameter with a 1½" diameter center opening. Available for pole or rack mounting; pole face attachment and insulator available separately. Ask the L-M Field Engineer for a sample.

L-M INSULATED PRIMARY LEAD BRACKET



A variety of applications. Many utilities find it particularly useful on crossarms to train primary and series street lighting leads. Wet-process brown glazed porcelain insulator 4 1⅛" long, 3" diameter, with 2¼" No. 22 galvanized-steel wood screw.

Many L-M Construction Materials to Help Solve Your Problems

L-M offers a wide variety of Line Construction Materials and Specialties to help simplify your construction jobs. Ask the L-M Field Engineer for literature; or write Line Material Company. Explain your problem and we'll be glad to make suggestions. Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

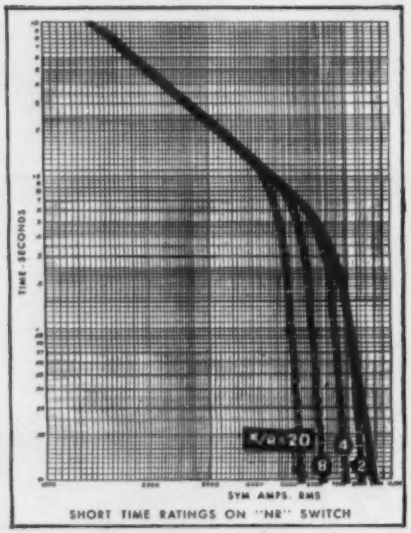
LINE MATERIAL

Line Construction Materials

L-M's Kyle Type "NR" remote control oil switch—the same switch used in L-M's switched capacitor racks.

"Field-Designed"—with the features users asked for.

200-amperes nominal load rating at 14.4 kv, 150 amperes for capacitor switching. 9000 amperes RMS asymmetrical momentary current rating.



SHORT TIME RATINGS ON "NR" SWITCH

Data 235A

L-M's "NR" Remote Control Oil Switch Provides Low Cost Capacitor Switching

Here is L-M's new motor-operated 200-ampere remote control oil switch. It is specially designed for low-cost capacitor switching up to 3500 kvar 3-phase, but is equally suitable for street lighting, flood and airport lighting, protective lighting, sectionalizing, and other remote control switching applications. Ratings meet users' needs and requirements for capacitor switching and many other applications.

The contact structure is so designed that heavy currents increase contact pressure and give the switch high momentary and short-time current ratings. Spring-loaded contacts give very fast "make" and "break"—which eliminates restrikes and minimizes contact erosion when closing in on large capacitor banks.

The switch can be bolted directly to the pole, or crossarm with a thru-bolt or crossarm-mounted with a clamp-around hanger. Clips also available for mounting on substation steel structure.

Control motor requires less than one ampere at 120 volts, which permits the lightest wiring, simpler control circuit, and gives longer life for limit switches and relays.

Get Full Information

Ask the L-M Field Engineer for details on this new Type NR Switch—or write Line Material Co., Milwaukee 1, Wis. (a McGraw Electric Company Division).

Type "NR" Switch Ratings

SINGLE PHASE

VOLTAGE

Nominal	RMS 14.4 kv
Maximum design	RMS 15.0 kv
60 cycle, one minute withstand, dry	RMS 35.0 kv
60 cycle, ten-second withstand, wet	RMS 30.0 kv
1½ x 40 Ms impulse withstand, crest, BIL	95.0 kv

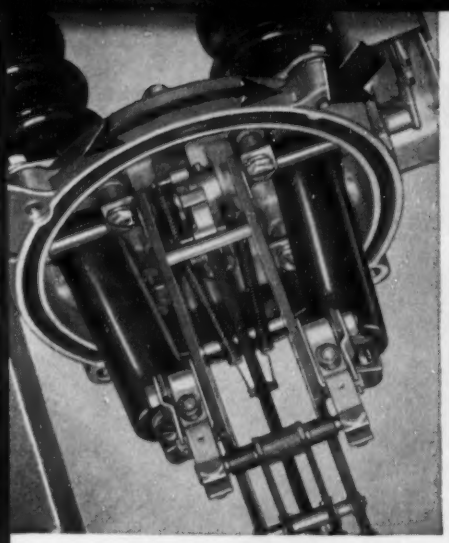
CURRENT

Thermal	200 amperes
Capacitor switching, nominal	150 amperes
Inductive load switching,	
75 to 100% PF	200 amperes
50 to 75% PF	100 amperes
Less than 50% PF	50 amperes
Momentary, RMS Asymmetrical	9000 amperes
Short-time, RMS Symmetrical	
10 seconds	1400 amperes
1 second	4500 amperes

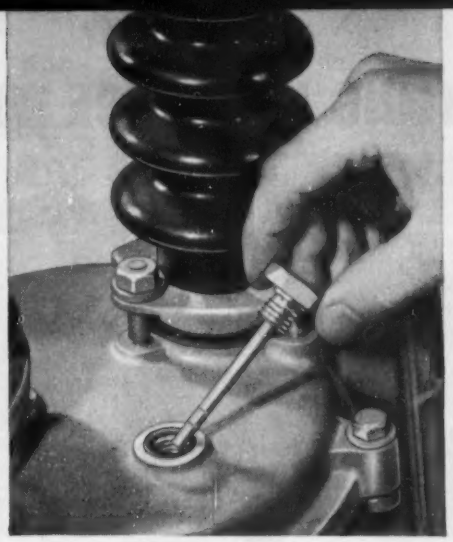
For larger ratings at shorter time intervals see curve, Data 235-A above.

CONTROL

Motor-operated actuator requires less than one ampere at 120 volts. Permits simplest control circuit and gives long life of limit switches and control relays.

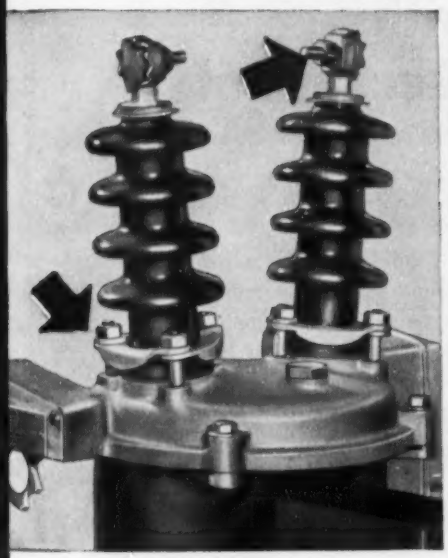


Head may be rotated and set at desired position. Lips in the groove on the underside of head hold the gasket so that it doesn't fall out when the cover is lifted.

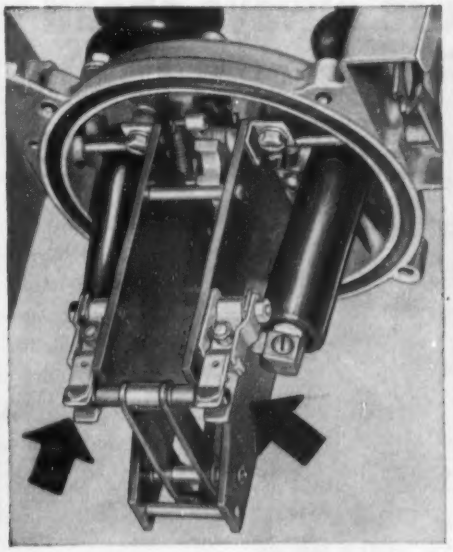


Oil dip stick on the head for checking the oil level. The tank holds 1½ gallons of oil. The inner mechanism is insulated from the tank by the oil and by a tank liner.

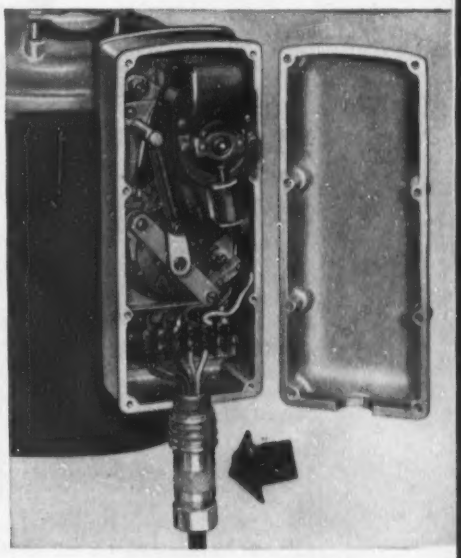
Heavy bracket for direct mounting to pole or crossarm with or without a hanger. Heavy tank, with inserted concave bottom, so that only the rim takes abrasion.



The bushings are the clamp-on type which make replacement easy. Bushings are oil-filled for lowest radio noise level. Plated Universal terminals for aluminum or copper conductor, No. 8 to 2/0.



Contacts arranged so heavy currents increase contact pressure, giving high momentary and short time current ratings. Spring-loaded contacts give quick make and break to prevent restrikes and minimize erosion.



Motor-operated actuator requires less than one ampere at 120 volts, permitting lighter wiring and simplest control circuit, and assuring long life for limit switches and relays. Weatherproof plug-in connection at bottom of box and weatherproof plug available.

CAPACITOR SWITCHING RATING

Voltage	Based on 25 KVAR Units				Based on 15 KVAR Units			
	Three-Phase		Single-Phase		Three-Phase		Single-Phase	
	Bank Size KVAR	No. of Units	Bank Size KVAR	No. of Units	Bank Size KVAR	No. of Units	Bank Size KVAR	No. of Units
2400	600	24	350	14	585	39	360	24
4160	1050	42	625	25	1080	72	615	41
4800	1200	48	725	29	1215	81	720	48
7200	1800	72	1075	43	1845	123	1080	72
12470	3225	129	1850	74	3240	216	1860	124
13200	3375	135	1975	79	3420	228	1980	132
13800	3525	141	2050	82	3555	237	2070	138

LINE MATERIAL

Kyle® Oil Switches

Like all Kyle reclosers, the Type NR switch is filled with ORTO®, L-M's oxidation-resistant transformer oil, inhibited for longer life.

98B

HAS YOUR LIGHTING KEPT PACE WITH PROGRESS?

You're always ahead with Sylvania Fluorescent Lamps because of Better Appearance

The ends of Sylvania Fluorescent Lamps *stay cleaner!* The addition of zirconium oxide to the cathode coating greatly reduces excessive inside smudging and end blackening. So, for bright lamps and far better appearance, be sure you get *Sylvania* Fluorescent Lamps.

Remember, Sylvania is a leader in the development of fluorescent lighting, and offers you an assurance of complete satisfaction or your money back.* You can't buy a better fluorescent lamp!

*Try 24 Sylvania Fluorescent Lamps of any popular type. If, in your opinion, they don't give more light and maintain color and brightness for a longer time than any other brand, send them back with your signed Certificate of Assurance and your money will be refunded.

SYLVANIA

Sylvania Electric Products Inc., 1740 Broadway, New York 19, N. Y.

In Canada: Sylvania Electric (Canada) Ltd., University Tower Bldg., St. Catherine Street, Montreal, P. Q.

LIGHTING · RADIO · ELECTRONICS · TELEVISION

NEWS ABOUT PEOPLE

Albert Is Elected President . . .

. . . of California-Pacific Utilities to succeed the late James A. Ward. Dahlquist is named a director

E. K. ALBERT

E. K. Albert, executive vice president and director of California-Pacific Utilities Co, has been elected president to replace the late James A. Ward. (EW, Feb. 22, p 192). At the same time, T. W. Dahlquist, attorney, was elected to fill the late president's unexpired term as director.

Started as Chief Engineer . . . Albert has been with the company for more than 15 years, serving first as chief engineer. He was named vice president in 1941 and executive vice president in 1953. He has been a member of the board of directors for 11 years. He was chief executive in charge of expanding and maintaining plant facilities during the period of the company's greatest growth. Recently his responsibilities have been that of senior executive.

Dahlquist, a member of the law firm of Orrick, Dahlquist, Herrington and Sutcliffe, has served as general counsel for California-Pacific Utilities Co and its predecessor since its organization in 1930.

Detroit Edison Makes Engineering Changes

Detroit Edison Co has reshuffled its engineering organization by creating three new departments, and making administrative changes involving ten major promotions and new appointments.

Edward R. Moore, former chief engineer of Edison's engineering department, and Harvey A. Wagner, former assistant chief of the same department, have been named assistant managers of engineering. Wagner will also continue his assignment as co-ordinator of the nuclear power development department under the title of director of nuclear power development.

Department Directors . . . Edward L. Nugent, former assistant supervising engineer in construction engineering, will direct the new Design Engineering Department. James N. Livermore, former mechanical division engineer in construction engineering, will be assistant director. Nugent's responsibilities as assistant co-ordinator of Edison's nuclear power development department have been assigned to Robert W. Hartwell, who has been given the title assistant director of the nuclear development activity.

Simon Roth, former supervising engineer in construction engineering, will direct the new engineering coordination and services department. Assistant director will be Willis E. Losie, former staff supervising engineer of the engineering department.

W. Fred Wetmore will be director of the new planning and project engineering department. Wetmore was former chief electrical engineer of the engineering department. Harold C. Reasoner, former operating engineer of production department power plants, will be assistant director.

In addition, Edison has created a new tax department which will be headed by Anthony G. Maihofer, who was appointed supervisor of taxes. The tax department will be responsible for tax work previously done by the General Accounting and Property departments.

•

Ralph J. Cordiner, president of General Co, has been named recipient of the Stevens Honor Award, which is bestowed each year by Stevens Institute of Technology to an outstanding figure in American life.

Dr Warren C. Lothrop has been appointed a vice president of Arthur D. Little, Inc, Cambridge, Mass. Dr Lothrop, who will be in charge of the firm's Research and Development Division, was a technical aide on the National Defense Committee before joining the Little company in 1946.

E. A. Hengst has been appointed treasurer of American Gas & Electric Co and all AGE subsidiary companies, including the AGE Service Corp. Associated with the company since 1930, Hengst has been assistant secretary and assistant treasurer of the company and service corporation as well as assistant vice president of these three AGE subsidiary operating companies: Appalachian Electric Power Co, Ohio Power Co, and Indiana & Michigan Electric Co.

W. Raymond Parshall has been made treasurer and a director of Federal Electric Products Co, Newark, N. J. He will continue as comptroller of Federal, a position he has held since September, 1953. Prior to joining Federal, Parshall served Baldwin-Lima-Hamilton Corp, Philadelphia, as general comptroller from 1946 to 1953.

Made a Vice President

Phelps Dodge Corp has announced the election of J. M. Hawkins as vice president. Hawkins, who joined the copper producing firm in 1931, has served as comptroller since 1942. In addition to serving as vice president, he will continue as comptroller.

FRED J. GUNTHER

Kansas City P&L Elevates Gunther to Vice President

Fred J. Gunther, manager of operations for Kansas City Power & Light Co, has been appointed a vice president of the company effective today (March 1).

In other managerial changes, three top level engineers were given posts of greater responsibility. C. Myron Lytle, formerly manager of engineering, was named manager of system operations; C. C. Cornelius, former superintendent of overhead, was made manager of construction and maintenance; and A. J. Nicholson, engineer, was designated Lytle's successor as manager of engineering.

Gunther joined Kansas City P&L in 1947 as manager of operations. Prior to joining the Missouri utility, he was associated with Iowa Power & Light Co, serving as superintendent of that utility's Southwestern Division.

•

William A. Duncan, Jr, a member of the engineering department of Kentucky Utilities Co since 1935, has been promoted to assistant vice president in charge of operations. Duncan, a mechanical engineer, has been system planning engineer for the utility for the past year.

H. F. Cox, superintendent of electrical operations in the transmission and distribution department of Indianapolis Power & Light Co, has been promoted to assistant superintendent of transmission and distribution. The company also elevated **Alexander MacDonald,** supervisor of relays, to the post of superintendent of electrical operations and **John Kroeger** from head of substation maintenance to superintendent of substations.

C. C. Tippit, general purchasing agent of Reliance Electric & Engineering Co, Cleveland, since 1950, has taken over the administration of the company's purchasing systems and procedures now that **Jesse C. Davis** has reitred. Davis, director of purchases for Reliance since 1948, joined the company in 1915.

Eugene L. Gochnauer has been named the first superintendent of Hungry Horse Dam, Mont. He has been at Hungry Horse since 1951 as chief of the electrical and mechanical construction branch, specifically on the powerhouse.

Prof Loyal V. Bewley, head of the electrical engineering department of Lehigh University, has been appointed dean of the College of Engineering. Prior to becoming a member of the Lehigh faculty in 1940, Bewley served 17 years as research engineer of General Electric Co.

Richard M. Baker, for the past six years publicity manager for Ansul Chemical Co, Marinette, Wis., has been named advertising and sales promotion manager of Ansul. In another appointment, Ansul made **Brad Sebstad** publicity and publications manager. Sebstad is president of the Wisconsin Industrial Editors Association.

Walter S. Holmes, acting comptroller of Radio Corp of America, has been elected comptroller of RCA. Holmes, who joined the RCA staff in 1947, has served as acting comptroller since November, 1953.

William C. Jenner, formerly with Reliance Electric & Engineering Co, Cleveland, has joined Houghton Laboratories, Inc, Olean, N. Y. as chief electrical engineer. While with Reliance, Jenner was responsible for the firm's development and application work of electrical insulating materials.

Joseph R. McGilvray, who has guided Westinghouse Electric Corp's manufacturing and repair operations in the West since 1946, has retired after a 30-year career with the company. McGilvray, who joined the firm in 1924, was made in 1946 manager of the Pacific Coast district of the manufacturing and repair department at Emeryville, Calif. When Westinghouse acquired the Sunnyvale plant in 1947, he transferred his headquarters there, becoming assistant to the vice president last August.

I. F. Matthysse, formerly chief design engineer, has been appointed assistant chief engineer in the engineering department of Burndy Engineering Co, Inc, Norwalk, Conn. In another department appointment, **Dr W. F. Bonwitt,** previously chief planning engineer, was named chief administrative engineer. Matthysse has been in that Burndy department for 25 years, and Dr Bonwitt joined Burndy in 1938.

Philco Corp Reassigns 7 Top Level Executives

Philco Corp has announced the following executive changes:

Raymond A. Rich, vice president of the Refrigeration Division, was named vice president and general manager of that division to succeed John M. Otter, new vice president in charge of Consumer Product Divisions. Albert J. Rosebraugh, sales manager in Refrigeration Division in charge of refrigerator and freezer sales, was appointed vice president in charge of sales for that division.

Larry F. Hardy, president of Philco's Television and Radio Division, was designated vice president in charge of product development. With advancement of Hardy, full responsibility for the management of the Television Division now will be assumed by Frederick D. Ogilby, vice president and general manager of the division, and William H. Chaffee, vice president and general manager of the Radio Division, will be in full charge of that division.

In addition, Samuel N. Regenstrief, vice president of the Refrigeration Division, was made vice president in charge of manufacturing for all Philco's appliance products, including refrigerators, freezers, air conditioners, and electric ranges. He will also co-ordinate the manufacturing operations of Dexter Co, manufacturers of home laundry equipment, which is being acquired by Philco.

Play it safe!

In maintenance of ELLIOTT motors and generators use only GENUINE ELLIOTT RENEWAL PARTS

Make sure your Elliott motors or generators requiring parts renewal, will perform right up to Elliott standards. Use only parts that really fit the job, made with full knowledge of the specifications and characteristics of the machine. Apply coils correct in form with modern insulation... brush holders of original or Elliott-improved design... brushes of the right grade for the service... oil seals, and sleeve bearings that click into place like the last piece of a jig-saw puzzle.

In major repairs use Elliott factory facilities or the nearest Elliott-approved service shop, **and on all repairs use Elliott parts.** Order through your local Elliott representative or direct to Elliott Company, Ridgway Division, Ridgway, Pa.

"Modern" means

UP-TO-DATE TRANSFORMER DESIGN ENDS CORONA DANGER FOREVER

You no longer need worry about damage to power transformer insulation caused by creeping effects of corona. Your transformer investment will be completely protected when you specify a unit with corona-free design.

Testing Offers Proof

Testing methods now available provide positive assurance against even the smallest amount of corona. For example, transformers tested in Allis-Chalmers laboratories have gone through as many as 200 impulse shots. Result: inspection proved they were in just as good condition after the 200th shot as before the first.

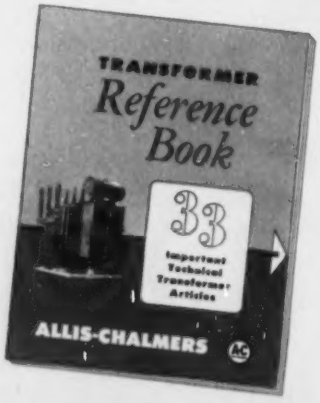
Accurate manufacture, exhaustive tests, and field performance are proving your transformers will continue to pay off many years after the corona-free seal has been placed on them at the factory.

A-4123

Get Important Transformer Information

Here's a convenient source for answers to transformer questions. Allis-Chalmers "Transformer Reference Book," just published, brings you 168 pages of information based on more than fifty years' experience designing and building transformers. It explains transformer theory, gives some of the "whys" behind transformer design, and tells important facts about transformer operation.

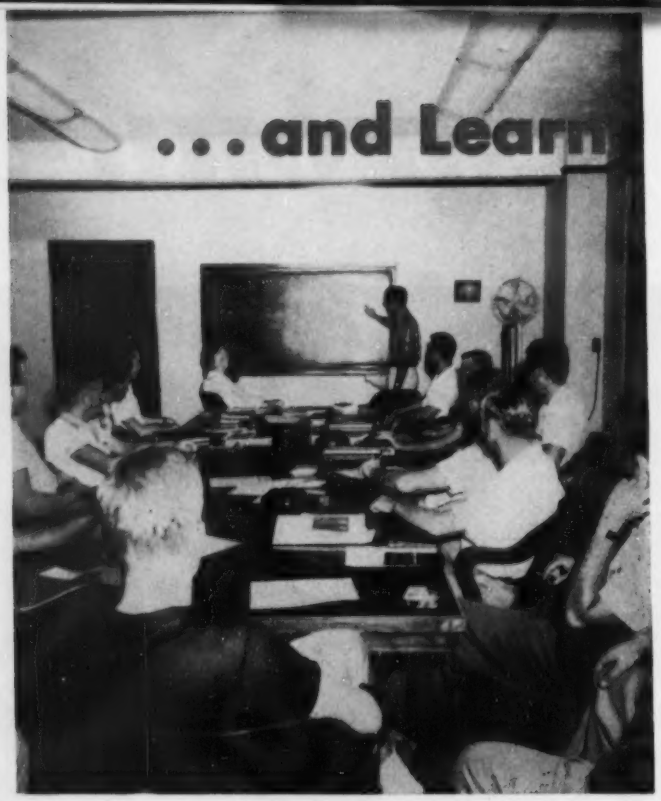
The 33 articles in this book were originally published in Allis-Chalmers "Electrical Review." Now they've been brought up to date with new material where necessary. To get your copy, send one dollar to Allis-Chalmers, Milwaukee 1, Wisconsin. Or call your nearby A-C district office and ask for a free, four-page brochure that tells all about this handy, informative book.



Corona-Free!

ALLIS-CHALMERS

A-C
ALLIS-CHALMERS



SYSTEM OPERATION problem is discussed by Larry Hudson, student engineer, at one of the regular Friday afternoon conferences of group

POLE SETTING operation by distribution pole truck crew is observed by engineering trainee. The beginners lend a hand whenever possible

Florida P&L has comprehensive training program which gives new engineers an opportunity to study all company operations

DON JOHNSON, Student Engineer
LOWIS BOWERS, Publicity & Advertising,
Florida Power & Light Co, Miami, Fla.

Practical experience is stressed in Florida Power & Light Co's fast-paced, comprehensive training program for future supervisors. The constant aim is to broaden their outlook and increase their interest in the company by giving them a thorough understanding of its operation.

Trainees work alongside regular employees in all major departments, spending extra time on duties they would not regularly perform. Engineers are taught by commercial personnel to be better salesmen. Men scheduled for commercial engineering learn to know and appreciate the responsibilities of the operating engineering department. This gives the trainees a well-rounded knowledge which will better fit them for a job in any department should the need arise.

Florida P&L Co serves one of the fastest growing areas in the country and has increased generating capability 200% since V-J Day, compared to only 64% for the country as a whole.

To fill key positions created by this record-breaking expansion, well-trained men were needed quickly. After analyzing long-range manpower needs, the company designed a unique training program.

The streamlined 75-day basic course covers practically all fundamental company operation. It materially cuts the time formerly required to indoctrinate a new employee. So far 82 men have completed the course.

Each year, a new group is scheduled for training. About half are regular employees selected for their ability. The others are from graduating classes of universities. Following group meetings at the schools, seniors are interviewed individually, and many have told company representatives that they joined FP&L because of the training program.

Said one recent Georgia Tech graduate, "When I finished college, I needed practical experience. Here was a chance to get broad experience in a hurry under alert supervision, to get my feet wet and understand overall company operation before settling down to a regular job. I turned down more lucrative offers in favor of Florida P&L."

At the beginning of the course, each trainee is assigned a sponsor executive who acts as counselor. Top company officials meet the trainees and explain company policies.

Each man assists in preparing his own schedule. Thirty-eight days must be spent in electric operations, 10 in the commercial department, 15 in

Plan Trains Future Supervisors

training conferences, 6 in general engineering, and 6 divided among observing procedures in the general office, power plants, and system operating department.

The student receives the same treatment as other employees, conforms to all regulations, and is under the direct supervision of the man in charge. Acting as observing helper, he watches work in progress, lending a hand and receiving explanations from supervisors and foremen. It is up to the trainee to take the initiative.

Electric Operations . . . During the 38 days in electric operations, the students observe transformer repairs, rubber goods testing, and service truck routine. They travel on line trucks, digger and pole trucks, and work with aerial cable crews. Vault and manhole construction, cable splicing, and testing of underground cable are demonstrated to them.

They learn about automotive maintenance, reclamation and salvage, and the work of the meter and relay test section. A trip on a trouble truck, study of diagrams, and methods used in localizing faults or trouble on the lines are included.

Working in the meter shop for three days, each man learns about testing and adjusting meters, gets a briefing on departmental procedure and goes out with a meter installation team.

General Engineering . . . The trainee is taught to think in terms of new engineering developments and long-range planning in the general engineering department. Construction standards are reviewed. He learns departmental procedure and works with engineers.

An explanation of work in a local office is given by the manager and followed by trips into the field with experienced customer contact representatives. The trainee spends four days with meter readers and collections in the customer service department. He hears an explanation of company accounting procedure and finances from the company treasurer.

Of great interest to the men is a study of the system operation which includes visits to all power plants in the area as well as the company's central load dispatching station. A more detailed assignment at a plant gives the trainee information about the betterment laboratory, plant maintenance and plant operations departments, where he works with water tenders, firemen, and watch engineers.

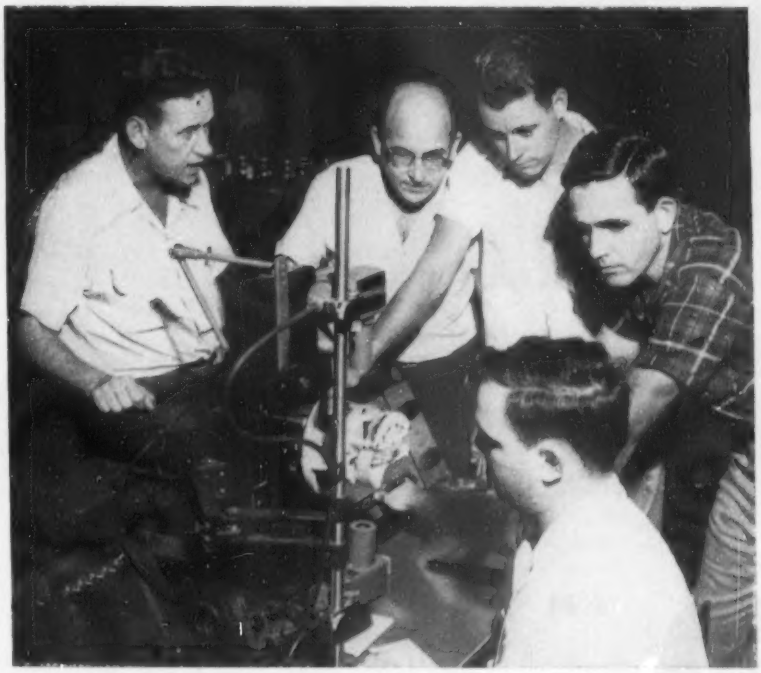
All trainees attend the half-day meetings held each Friday during the course. Current news about the industry, economics, public relations, and related subjects are discussed to enlarge further the trainee's viewpoint. By speaking on various subjects, trainees develop poise and speaking ability.

The training program receives full cooperation from company personnel because it has proved to have practical value. A sun-browned, hard working line foreman said, "We used to have trouble with engineers back in the office. They didn't understand our problems and didn't make allowances for conditions in the field. Now it is different.

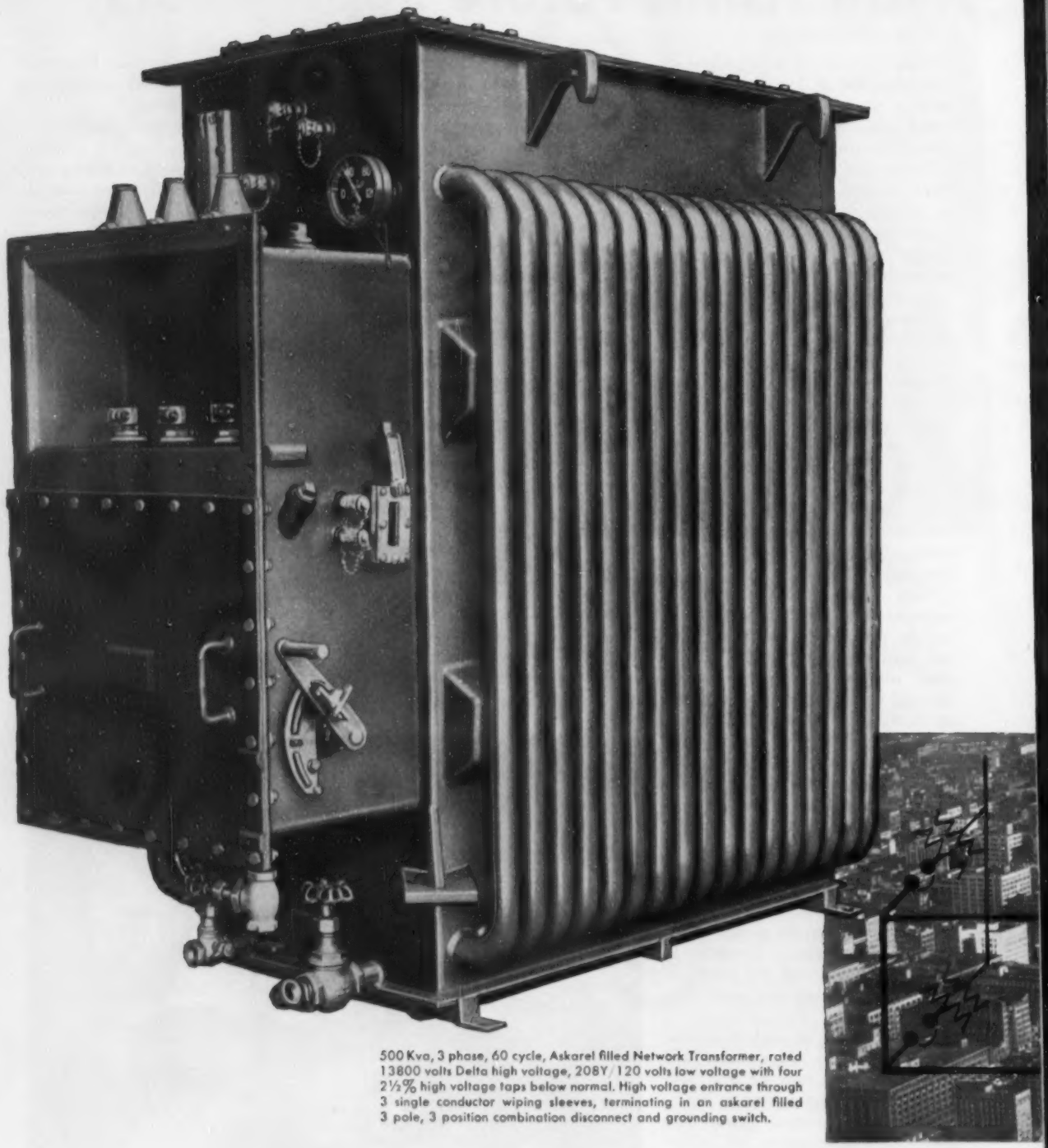
"A lot of men have worked with us in the last five years, and we find they allow enough time for work and are really safety conscious. These men help by explaining our problems in the engineering offices."

On the final day, the trainee is interviewed by an executive, his future is discussed and planned on a long-term basis, and a job rotation plan is set up. Engineers who will work in power plants enter a 40-day extension course in the commercial department. This gives them a further chance to familiarize themselves with customer relations. To encourage further study FP&L pays half the tuition for night or extension courses at a nearby university.

"After completing his training, an engineer has first-hand knowledge of what goes on throughout the company. Employee relations are improved because he has made friends with men he must depend on later," said J. B. Hiers, Jr, director of the training program. "With the practical experience he has gained, he has a broad understanding of management's problems. Out of the suggestions of these young men, we profit, too. Many suggestions for improvements in equipment and procedure have been adopted."



METER TESTING BOARD problem is explained by R. O. Bushnell, superintendent of the meter shop, to a group of future supervisors. Each training group spends three days in the shop

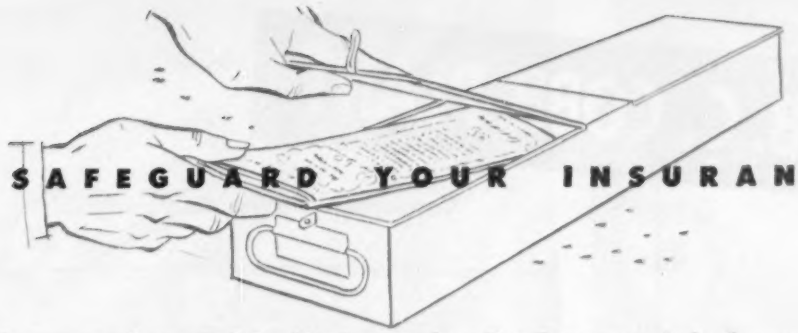


500 Kva, 3 phase, 60 cycle, Askarel filled Network Transformer, rated 13800 volts Delta high voltage, 208Y/120 volts low voltage with four 2½% high voltage taps below normal. High voltage entrance through 3 single conductor wiping sleeves, terminating in an askarel filled 3 pole, 3 position combination disconnect and grounding switch.

M O L O N E Y E L E

Manufacturers of Power Transformers • Distribution Transformers • Load Ratio

FACTORIES AT ST. LOUIS 20, MISSOURI AND TORONTO, .

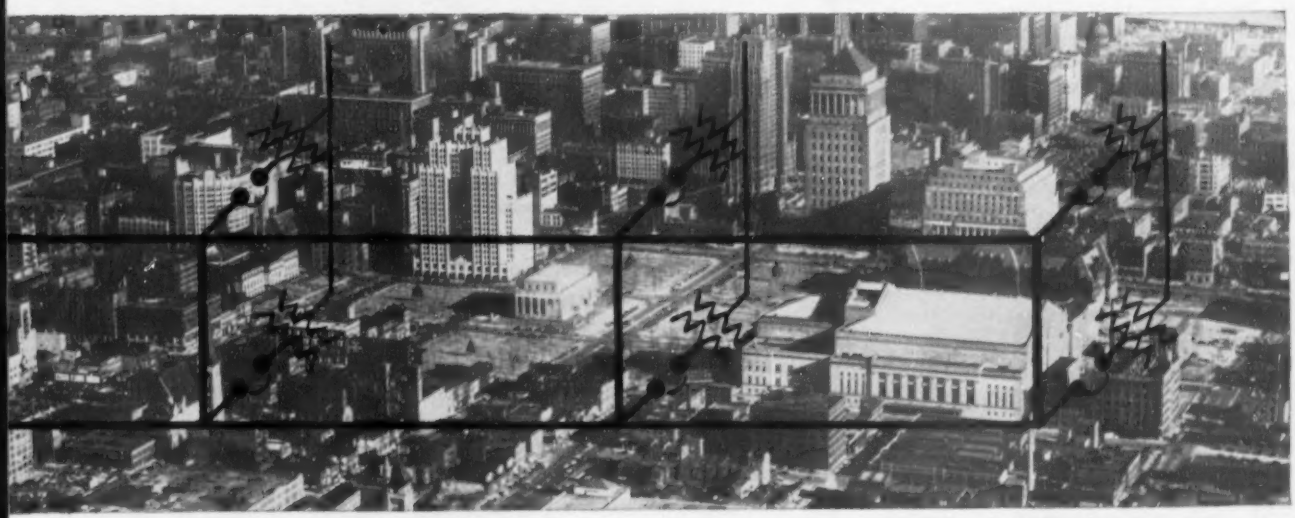


SAFEGUARD YOUR INSURANCE POLICY

Insurance coverage is defined in the text of a policy. Coverage or lack of coverage is definitely stated. Such policies are put in a safe place, pending need, by far sighted responsible persons.

The basic reason for a network system is to insure continuous operation in the event of unforeseen happenings. This insurance is a wise precaution which is becoming a standard operating practice with most utilities. The best assurance that this insurance is properly protected, is the best equipment. Moloney Network Transformers are designed to operate under unusual and strenuous conditions when necessary. By installing a network system you insure continuous operation even when one part of the system fails. By installing Moloney Network Transformers you doubly insure that the system will function because Moloney Network Transformers are more dependable and less vulnerable to failures.

MED4-6



C T R I C C O M P A N Y

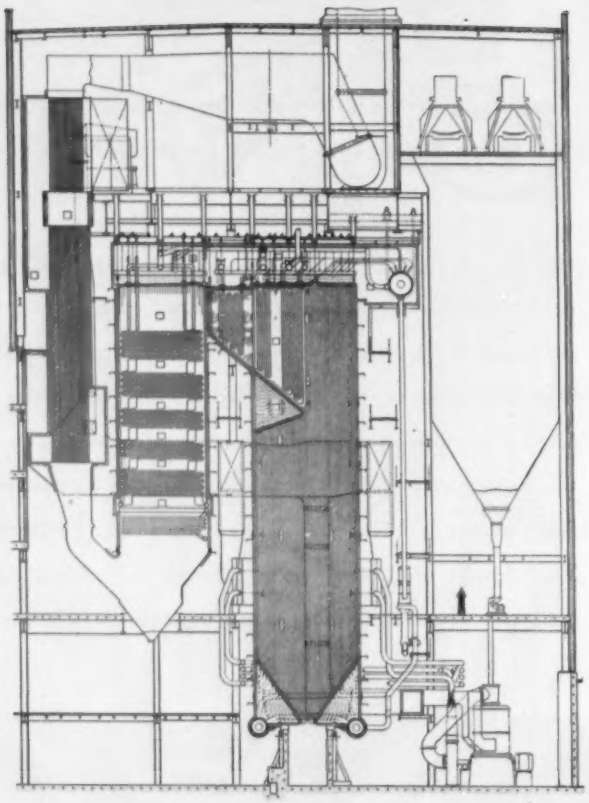
Control Transformers • Step Voltage Regulators • Unit Substations • Electronic Transformers

ONTARIO, CANADA • SALES OFFICES IN ALL PRINCIPAL CITIES

B. C. COBB PLANT

Consumers Power Company

C-E controlled circulation boilers



The C-E Unit shown above is presently in process of engineering for the B. C. Cobb Plant of Consumers Power Company at Muskegon, Michigan. Commonwealth Associates, Inc., are the Consulting Engineers.

It is designed to serve a 135,000 kw turbine-generator, operating at a throttle pressure of 2000 psi with a primary steam temperature of 1050 F, reheated to 1000 F.

The unit is of the controlled-circulation, radiant, reheat type with a divided furnace. The reheater surface is located between the primary and secondary superheater sections, and economizer surface is located below the rear superheater section. A tubular type air heater follows the economizer surface.

Pulverized coal firing is employed, using bowl mills and tilting, tangential burners.

B-732

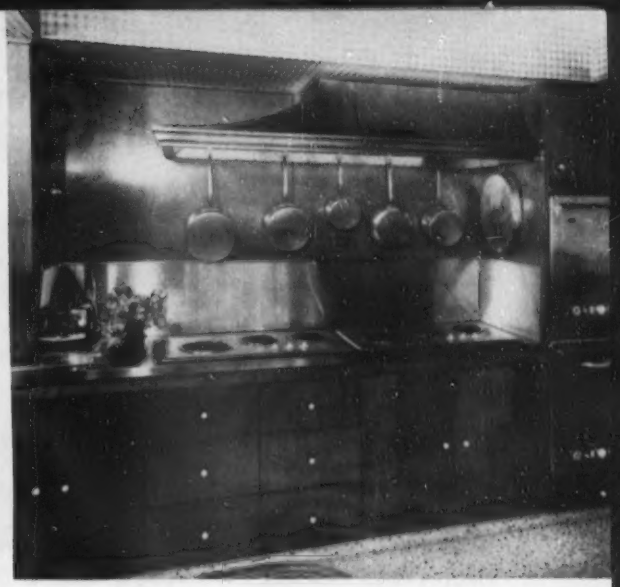
C-E

COMBUSTION ENGINEERING, INC.

Combustion Engineering Building
200 Madison Avenue, New York 16, N. Y.

BOILERS; FUEL BURNING & RELATED EQUIPMENT; PULVERIZERS, AIR SEPARATORS & FLASH DRYING SYSTEMS; PRESSURE VESSELS; AUTOMATIC WATER HEATERS; SOIL PIPE

HOUSING BOOM means thousands of new homes and customers to be served by company. Industrial and commercial load grows too



DREAM OF EVERY WOMAN is an electric kitchen like this. Though not so elaborate, thousands are raising energy use

A New Perspective on Utility Selling

GEORGE N. HAWLEY, Vice President, Southern California Edison Co, Los Angeles 53, Calif.

To meet changing times and conditions, Southern California Edison Co has reshaped its sales policy to fit in with new forces now at work. Basically, there are three major facets to the company's new look at selling:

1. Interpretation not Promotion—An electric utility should concentrate on producing an adequate supply of electric energy in the most efficient manner. It should also interpret the uses to which this energy may be put. To concentrate on this two-fold task under today's inflationary conditions, the utility must rely on manufacturers and distributors of electrical utilization goods to make, promote, and sell their products.

2. Pioneering New Devices—There still remains work to be done on the development of new electrical devices. This is pioneering more in the sense of gaining experience of use in the field than in the sense of selling. The case of the heat pump illustrates this conception. Experience gained from the installation of 36 units, mostly in the company's commercial offices, will be of great value to manufacturers as regards their own sales promotion.

3. Customer Services—The utility is expected to stay abreast of the entire field of development within the industry so as best to advise customers on methods of electrifying the home, farm, or factory. The main purpose is not so much sales promotion as it is building good will through good service by seeing that customers' needs are met properly. This requires an adequate staff of skilled personnel as an integral part of utility operation. Also required is the whole-hearted support of the management.

New Forces Prompt a Change . . . Southern California Edison's new look at selling is based on conditions that have changed significantly since 1945. A great expansion in population, homes, industries, agriculture, and general business has produced these estimated increases in the ten counties of southern and central California served wholly or in part by the company:

		Increase 1946-53
Population	1.7 million	33%
New homes	775,000	—
New industrial plant	$1.5 billion	—
Annual retail trade	$2.5 billion	55%

Here are examples of what happened to the company's system in the same period:

		Increase 1946-53
Peak load	860,000 kw	84%
New customers	500,000	76%
Electric ranges installed	48,000	109%
Plant investment	$400 million	107%
Total estimated number of present appliance dealers	900	—

The industrial complexion of the area has been fairly well diversified by an influx of new types of plants. While the expansion in air-frame manufacture represents a large part of the total increase, there has been substantial growth in basic industries like steel, petroleum products, chemicals, and plastics.

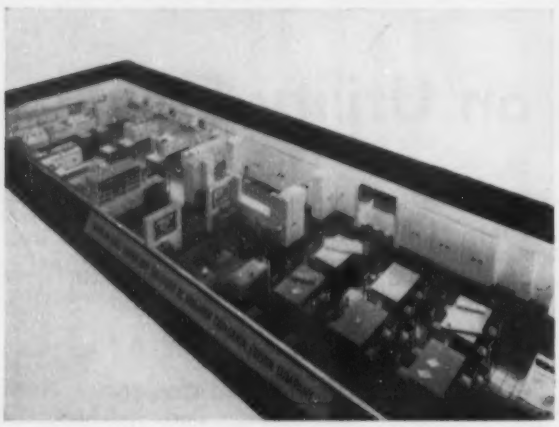
The eight-year boom in new housing still is in progress. It is probably more pronounced in our area than in most other areas in the country. New residences have been built in 500 and 1,000 unit tracts.

As a result of this wave of expansion, sales of energy to all classes of customers have grown enormously. But the reason for this great rise in consumption, and for the sale of electrical utilization equipment behind this consumption, lies outside the company. Forces other than sales pressure that have been at work in the market include national economic and fiscal policies. The redistribution of income and the emphasis on a higher standard of living have put the general public in a receptive mood

Customer services interpret use, rather than sell appliances

ELECTRIC LIVING CENTER in a company office brings to many women their first realization of advantages of an all-electric home

COMMERCIAL RELIGHTING to build merchandise appeal was installed with aid of consultants in design and location of fixtures



HOMEMAKING DEPARTMENT LAYOUT educates school officials. Help is also given in the selection of appliances for school use

PARTICULAR NEEDS of commercial cooking customers are met by company consultants who make layouts and specify equipment

toward modern appliances. Thus, demand has been greatly stimulated.

Because Southern California Edison did not actively participate in the sale of electrical equipment, it is obvious the normal trade channels expanded to meet the demand. Therefore, there exists today sufficient distributive facilities to handle enormous volumes of merchandise. Fundamentally, the sale of electric appliances presents no new problem.

The time has passed when electric utilities must aggressively promote and sell such appliances as ranges and water heaters because of the lack of public acceptance. There is ample supply of the devices, and customers generally are aware of their attractions. In fact, householders are spending a large proportion of their budgets on such items.

There is no group more interested in building a great demand for appliances than the manufacturers, wholesalers, and dealers. Furthermore, no group is better qualified to do the job. In the past several years this group has demonstrated it can do the job without assistance.

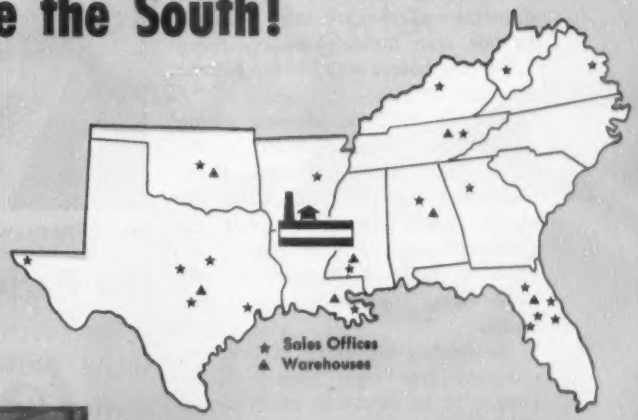
On an estimated gross revenue of $141 million in 1953, the company spent nearly $1.5 million to maintain the sales staff and for advertising in connection with our sales operation. Because of a major rate case, emphasis in recent advertising has been placed on explaining the necessity for the rate increase rather than on directly stimulating consumption. About $300,000 will be spent this year on institutional advertising.

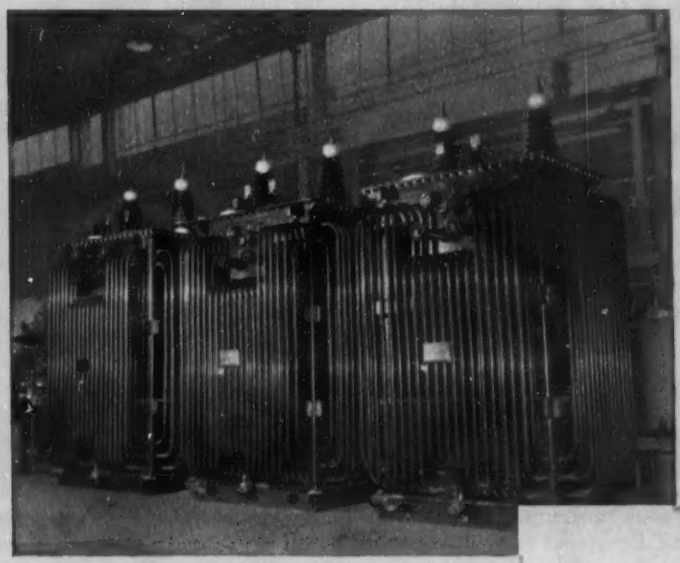
Because of the increase in population, our residential sales activity has been geared to a mass technique. We serve almost one million residential

ADEQUATE WIRING promotion ad is company's way of aiding contractors and dealers

KUHLMAN—the first nationally known transformer manufacturer with a plant in the South . . . to serve the South!

Established in 1952 to manufacture transformers in the South — for the industrial needs of the South — Kuhlman's Southern Division at Crystal Springs, Mississippi, is located close to the center of the great Southern market. With offices and warehouses in principal cities throughout the South, Kuhlman is well situated to serve Southern utilities and industry.





This big, modern plant of Kuhlman Electric Company at Crystal Springs is completely equipped to build dependable transformers that will provide a steady source of power for Southern utility and industrial customers. From here, transformers can be shipped directly to any part of the South.

These three 2500-KVA, Single Phase, 69000-volt primary Kuhlman Power Transformers were built at Kuhlman's Southern factory. Kuhlman also builds Distribution, Dry Type, Subway, Saf-T-Kuhl, CSP and Series Street Lighting Transformers. For complete information, write today.

KUHLMAN

150

KUHLMAN ELECTRIC COMPANY, BAY CITY, MICHIGAN • Southern Division, CRYSTAL SPRINGS, MISSISSIPPI

EXPORT REPRESENTATIVE: INTERNATIONAL STANDARD ELECTRIC CORP., 15TH FLOOR, 50 CHURCH STREET, N. Y. 7, N. Y. CABLE ADDRESS: MICROPHONE, N. Y.

SIXTY YEARS OF PROGRESS IN THE ELECTRICAL INDUSTRY

customers. Our residential sales staff cannot contact all of the 60,000 new residential customers appearing each year. Therefore, they concentrate on the builders of housing projects.

Competition in the sale of new homes is increasing; so builders are offering the all-electric home with light conditioning—and even with air conditioning—as primary sales features. In one area builders are equipping 1,500 new homes with built-in electric ranges.

Early in 1953 the adequate wiring advisory staff was converted to all-service residential consultants. These men work with builders on the all-electric home. The adequate wiring problem is solved when major appliances and such features as light conditioning are included in the new home.

As another residential service, the company has eight electric living centers in its offices in major cities. These consist of a small auditorium equipped with full electric kitchen equipment where dealers may have meetings, radio shows, etc, and where demonstrations may be held.

Interpretation Is Keystone . . . The company believes that interpretation of the uses of electricity is a keystone in its sales policy. Thus, the sales staff includes technical specialists to advise and assist industrial, agricultural, and commercial customers. Effective cooperation with manufacturers and distributors of utilization equipment is a necessary part of the operation.

These technical specialists translate into action 11 services that the company offers free to its customers. In brief, some of these services are:

Power consultant—Recommend types of electrical applications in production operations.

Lighting consultant—Advise and assist customers in lighting layout for commercial and industrial uses.

Rate advisory—Inform and assist the applicant for service in obtaining the lowest rate available to him.

Commercial cooking—Suggest ways to lower operating costs and increase the customer's profits.

Pump testing—Assist owners of water-well pumps to obtain maximum efficiency from the pumping plant.

Industrial heating—Advise on heating problems connected with new equipment or to increase the efficiency of existing equipment.

GAIL A. HATHAWAY

Rio Parley Set

First sectional meeting of World Power Conference in Western Hemisphere July 25

Plans are being completed for the first section meeting of the World Power Conference ever held in the Western Hemisphere.

Six days of technical sessions and a ten-day tour of important power installations in Brazil will feature the meeting to be held in Rio de Janeiro beginning July 25. Some 100 U. S. engineers are expected to attend along with 400 representatives of the 39 other nations which participate in WPC activities.

Gail A. Hathaway, special assistant to the chief of Army Engineers, has been designated chairman of the delegation representing the U. S. National Committee of WPC.

There are 14 members of the U. S. National Committee of WPC representing professional engineering societies, electric utilities and industries, and state and federal governments.

Utility representatives are R. G. Rincliffe, president of Philadelphia Electric Co for the Association of Edison Illuminating Companies and Walker L. Cisler, president of Detroit Edison Co, for Edison Electric Institute.

Hathaway, chairman of the U. S. National Committee, represents the American Society of Civil Engineers.

More than 50 technical papers have been submitted for discussion at the section meeting.

Registration fee for the Rio meeting has been set at $35 and cost of the ten-day tour will be about $200.

Santee-Cooper Grows

(*Continued from page* 19)

powerhouse. The 180 by 60 ft lock is 78 ft high, until recently the world's highest. The project has one 13,500 hp and four 40,000 hp turbines installed and has room for another 40,000-hp unit.

During a year of average stream flow generating capacity will produce 410 million kwhr of firm and 290 million kwhr of secondary power. Average annual generation of the 132,615 kw of capacity is about 583 million kwhr. A maximum of 831 million kwhr was reached in 1949, a good water year.

Huge Potential . . . To this framework, SCPSA last year added its 80,000-kw steam plant and began receiving its first power from Clark Hill Dam.

The $14.5 million plant is designed for an ultimate capacity of 300,000 kw and a maximum capability of almost a billion kwhr. According to SCPSA officials it was needed to firm up the vast amount of secondary power developed by Santee-Cooper.

Also helping to diminish its power supply problem is the still undetermined percentage of power that SCPSA will be receiving from Clark Hill. At present it gets 12 million kwhr per month and some dump power when it is available.

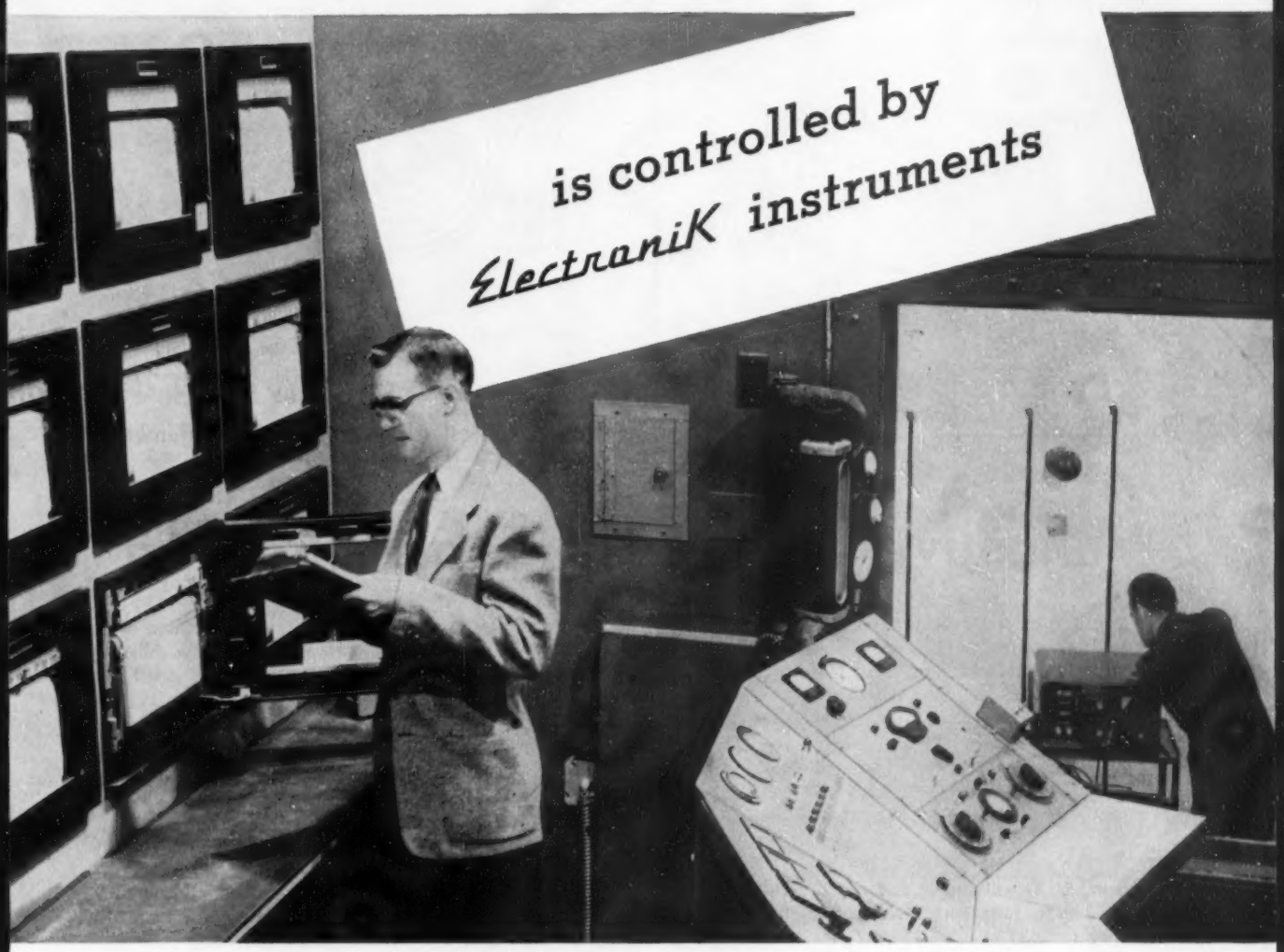
One of SCPSA's major system problems at the moment is to iron out the operational organization for the facilities of Central Electric Cooperative, headquartered in Columbia. CEC was set up after the Rural Electrification Administration came through with a $13.6 million loan for construction of a power loop to connect 16 distribution co-op members.

SCPSA has leased the power lines, will maintain them, and, when the loan is repaid, will own them outright. SCPSA is already supplying power to 14 of the co-ops from 35 points.

Things to Come . . . At present there is nothing to prevent SCPSA from constructing still more steam plants at strategic points along CEC lines. This would put additional low-cost power in the midst of territories now served by private utilities.

This situation aggravates advocates of private power development, who already have viewed with alarm the growing strength of the Authority.

First "civilian" atomic reactor



Instrument control panel for new low-power nuclear reactor at North Carolina State College.

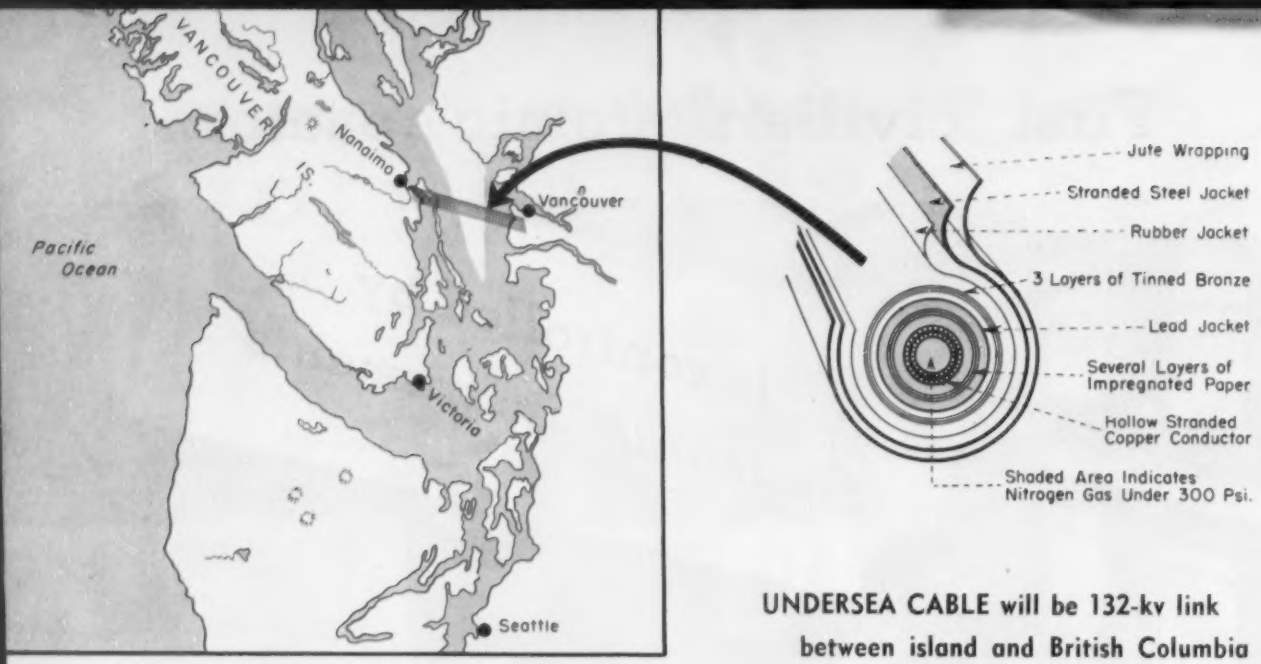
RESEARCH into the utilization of atomic energy took a significant forward stride with the completion of North Carolina State College's new low-power nuclear reactor. For this marked the birth of the first privately-owned reactor, and the first intended solely for investigation of non-military uses of the atom.

Although small by Oak Ridge standards, this reactor requires top quality instrumentation. And here as in many big government-operated installations, *ElectroniK* instruments are the choice. Their precision, sensitivity and dependability provide the performance essential to monitoring and controlling the complex, inter-related variables of reactor operation.

To power engineers investigating the practical utilization of nuclear energy, Honeywell offers a wide line of instruments applicable to laboratory research and full-scale reactor operation . . . and extensive field experience in engineering complete instrumentation for the varied phases of atomic power.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.

MINNEAPOLIS
Honeywell
BROWN INSTRUMENTS
First in Controls



UNDERSEA CABLE will be 132-kv link between island and British Columbia

Vancouver Island Tie Cable Ordered

British Insulated Callender's Cables, Ltd., Manchester, England was awarded in February the British Columbia Electric Co's contract to build and install the world's longest underwater power system. The cable will have a capacity (120,000 kw) and transmission voltage (132 kv) unmatched anywhere, BCE engineers claim.

For an amount slightly over $3 million, BICC will supply and install by mid-1956 four lengths of cable totaling some 77 miles of 138-kv, gas-pressure-type cable across Georgia Strait, separating the British Columbia mainland from Vancouver Island. The cable will link up the BCE's mainland hydroelectric facilities with the island's system.

The cable, British Columbia Premier W. A. C. Bennett predicted, "will greatly increase Vancouver Island's potential industrial expansion, which otherwise would have reached its maximum stage within the next decade, owing to limited power on the island itself."

BICC was awarded the contract, BCE officials stated, because its bid was about $1 million below the nearest competing bid. It collaborated with the British Electricity Authority last summer in sea trials for the England-to-France, cross-channel project.

"Several months will be needed to re-tool the Manchester factory before work on the cables can be started," Tom Ingledow, BCE vice-president and chief engineer, stated.

"There is at present no plant on this continent or in Europe capable of turning out unbroken lengths of power cable 14 miles or more long as required on this project."

The record capacity underwater circuit will consist of three cables for normal operation and a spare. In addition to the submarine cable overhead lines will be installed at each end to connect the circuit with the mainland and island systems. The overhead work will be erected by British Columbia linesmen. The whole project will cost $5 million.

This project, designed to fulfill BCE's power requirements on Vancouver Island for the next 10 to 12 years, will connect the island with the company's existing transmission line south of Nanaimo. Total length of the circuit will be about 46 miles, of which 27 miles will be overhead transmission.

The anticipated route requires continuous lengths of cable each approximately 17 miles long to be laid under water at depths up to 600 ft. The S. S. Seafisher has been reserved and will have her holds adapted to accommodate the long coils of cable which will weigh some 4,000 tons. She will sail direct from the Manchester Ship Canal to Vancouver early in 1956.

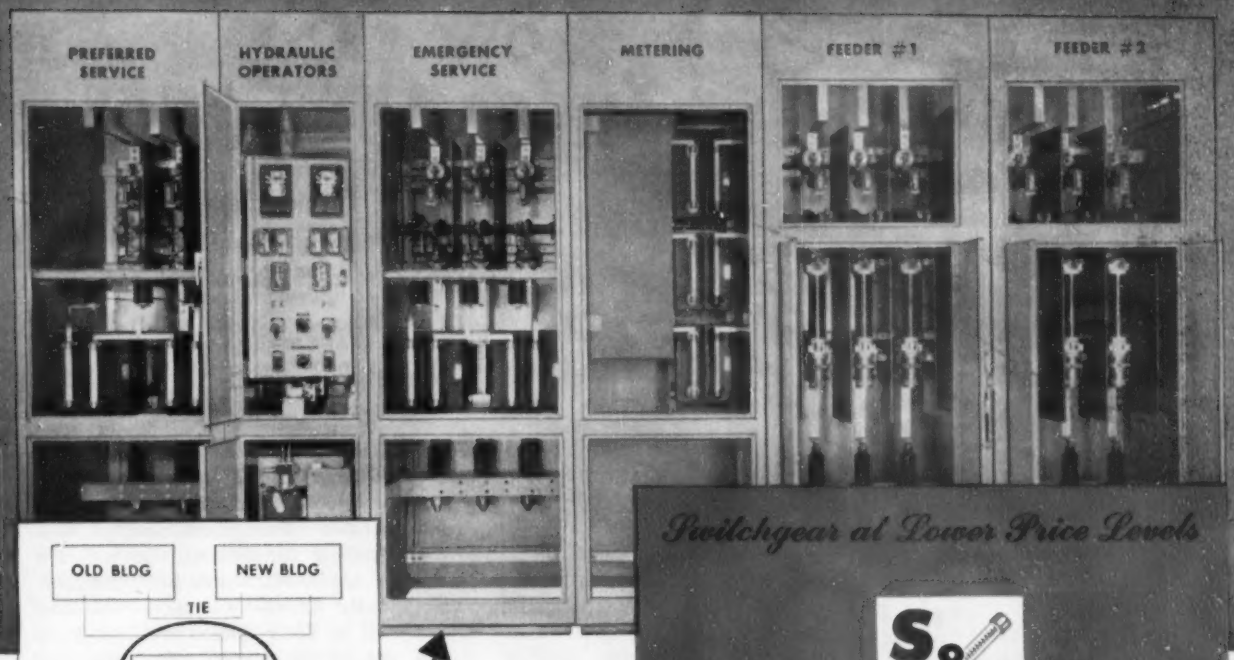
The cables, however, will be laid by Her Majesty's Telegraph Ship, Alert, which is one of the few cable-laying vessels afloat able to handle a job of this magnitude.

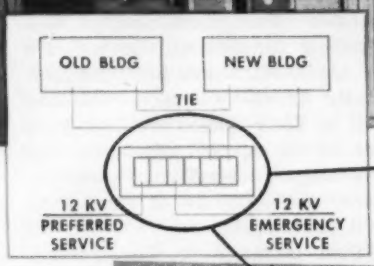
The cables measure between 4 and 5 in. in dia. The energy is carried in a hollow stranded copper conductor about 1/3 sq in. in cross section.

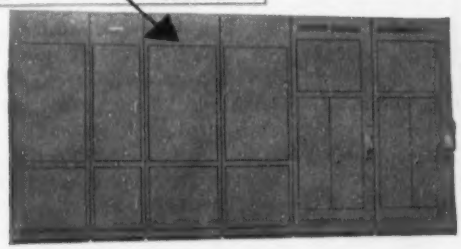
Around the copper core are wrapped several thicknesses of impregnated paper. A lead jacket comes next, and from the lead jacket inward toward the center, nitrogen gas under pressure of 300 psi forms a permanent insulation.

Three thin layers of tinned bronze separated the lead jacket from a rubber covering which lies just inside the galvanized stranded steel armor protecting the entire cable from rubbing and wear against underwater rocks. Outside all is wrapped a waterproofed jute serving.

Completion of the cable will signal the end of BCE's use of supplementary power from the British Columbia Power Commission's John Hart Plant at Campbell River, in the central part of Vancouver Island. BCE has four plants on the island.







Switchgear at Lower Price Levels

METALCLAD SWITCHGEAR

reduces cost about half for switching centers

When a hospital recently undertook a modernization and expansion program, the enlightened use of this switchgear cut the cost of the switching center in half.

The 6-bay unit was installed to provide preferred and emergency sources of 12,000-volt power (with automatic throwover and return), and metering, plus switching and protection of the outgoing feeders to the load centers in each of two buildings. Secondary circuits are 220-volt 3-phase power, and 120/240 lighting.

The program also involved changing the supply voltage from 4 KV to 12 KV for greater over-all economy.

Scores of installations in a wide variety of industrial plants, public and commercial buildings have demonstrated beyond question that S&C reliability and performance cannot be surpassed . . . and you pay substantially less.

●

If you are planning a new installation, or have the job of modernizing an old one, don't let specifications leave the drawing board without first finding out how S&C Metalclad Switchgear can save you money.

Nearly always it affords the lowest cost way to a thoroughly reliable switching center or service entrance unit. Write for full information today.

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SPECIALISTS IN HIGH-VOLTAGE CIRCUIT INTERRUPTION

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Please send me your new booklet on S&C Metalclad Switchgear. No obligation on my part, of course.

Name_____ Title_____

Company_____

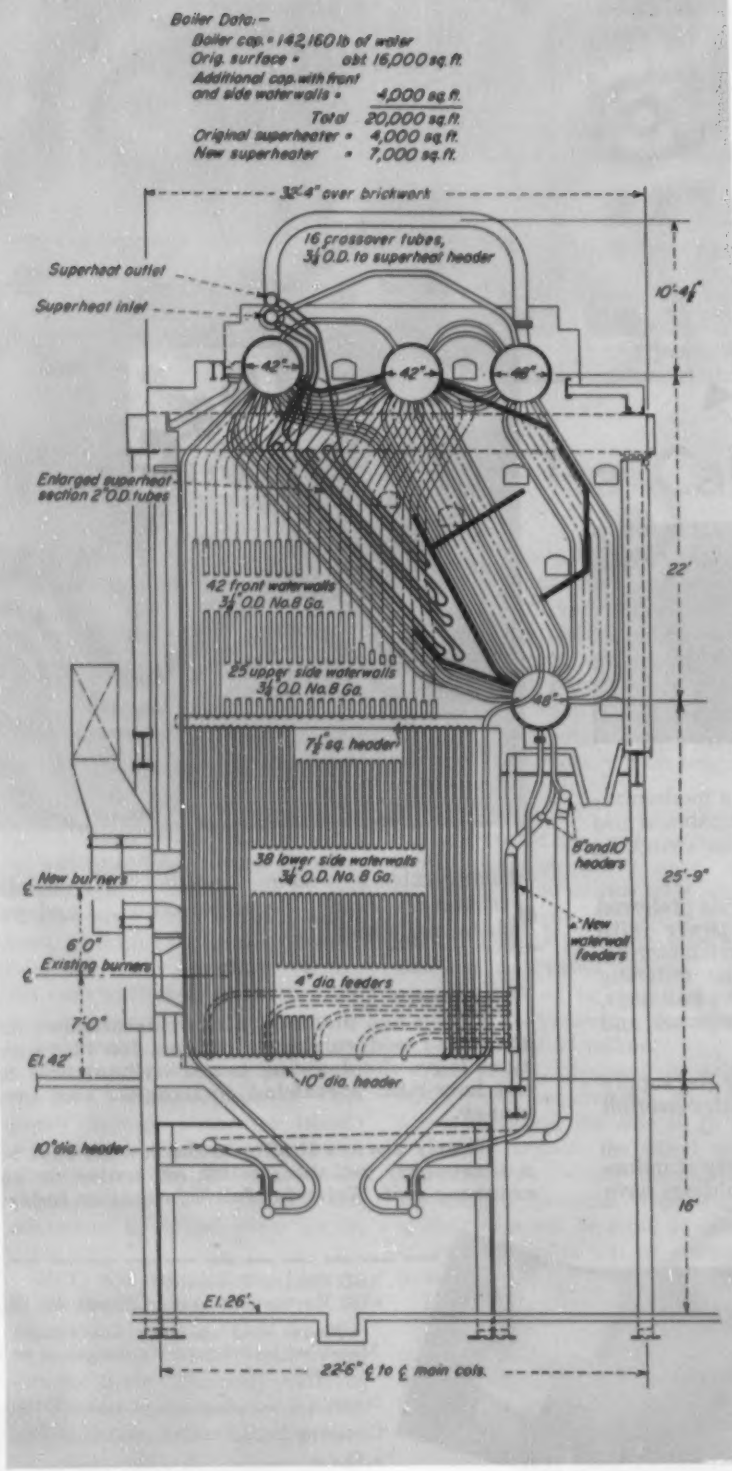
Address_____

City_____ Zone____ State_____

Extra Boiler Tubes Up Capacity

Tacoma Light remodels old installation and adds 27,000 kw to 25,000-kw station

J. FRANK WARD,* Superintendent, Light Division, Tacoma City Light, Tacoma, Wash.



Simply by adding waterwall tubes to three sides of two boilers in its Steam Plant No. 2 Tacoma City Light has doubled the plant's capacity. New steaming capacity will be sufficient to add a 31,250-kva turbo-generator to the 25,000-kw station. The cost will be $2.25 million or about $110 per kw of expected capability. The addition will boost Tacoma's total capacity to 297,000 kw of which 238,000 will be hydro.

Built in the early thirties, Plant No. 2 had two four-drum, Stirling-type boilers with pulverized coal firing. Design throttle conditions for steam of 375 psig and 725 F were never attained. Coal firing produced steam at 620 F. Oil firing, introduced in 1949, produced it at 580 F maximum. When the plant was converted to oil, a new combustion control system was installed. Coal burners were retained for emergency use.

Only the rear walls of the original boilers were lined with tubes to form a waterwall. The capacity of each boiler was 184,000 lb per hr at drum pressure of about 420 psig. The steam-generating surface initially totaled about 16,000 sq ft. But the steaming capacity was greatly in excess of the 25,000-kw turbo-generator requirements. In a test that was limited by the ability of the two burners per boiler to pass more oil, each unit developed 230,000 lb per hr. But because of low steam temperature, this heat input rate was equivalent only to about 200,000 lb per hr of 400-psig, 725F steam.

Three Sides Will Be Waterwalled . . . A study indicated that by adding waterwalls around three sides of each

*Mr. Ward recently left Tacoma to take up his duties as the first managing director of the Washington State Power Commission. His new headquarters are at Seattle.

furnace and two oil burners, sufficient steaming capacity would be provided to support another unit. New waterwalls will add about 4,000 sq ft of tube surface to each boiler. Guaranteed steam output of the new boilers is 260,000 lb per hr at 735 F. But the first boiler has already produced in tests 305,000 lb per hr at 725 F.

Tests will be made on the second boiler in spring. Equally successful results are expected from it. If this proves true, the two boilers will support about 52,000-kw net output.

As part of the boiler work, an enlarged superheater has been installed, in addition pertinent changes have been made in steam, water, and electrical circuits and controls. Surface area in the new superheater is 7,400 sq ft, about 3,400 sq ft more than in the old unit. To improve draft conditions, the 200-hp, 900-rpm, forced-draft fan motor has been replaced with one of 350 hp, 1,200 rpm, and the 200-hp, 700-rpm, induced-draft fan motor has been replaced with one of 350 hp, 900 rpm.

The air preheater will not be changed until tests can be run to determine what pressure drop will occur in the preheater and what the heat-transfer rate will be under the new steaming conditions.

Capacity May Be Increased . . . The original unit installed in 1931 was an 1,800-rpm, 30,000-kw, air-cooled machine. The second unit is 3,600 rpm, 20,000 kw, 80% pf with hydrogen cooling.

Other possible changes include alterations to existing auxiliaries to remove bottlenecks that may develop, installation of additional boiler capacity, or introduction of one or more gas turbogenerators into the cycle. In this last case exhaust heat from gas turbines would be utilized for feedwater heating. Thus, extraction load on the turbo-generators would be relieved, permitting more output from each unit with less steam. This would be similar to the installation at Huey Station of Oklahoma Gas & Electric Co.

Existing electrical control room of the plant has panel space provided for controls and instrumentation for the new unit. This reduced electrical work to the minimum. Cost was also reduced by the fact that the existing, 60,000 gpm, cooling water intake and outlet mains were large enough to handle both units. It was only necessary to make short branch connections to the original 48-in. main for the second condenser.

The old turbine room has been extended 70 ft to accomodate the new unit. The craneway for the 75-ton crane has also been extended.

Engineering and planning for the project were carried out by the engineering staff of Tacoma City Light. When necessary an eastern consulting firm was called upon information and assistance.

Total Cost of New Addition

Boiler work	$350,000
Foundations and building addition	250,000
Turbogenerator, condenser, and auxiliaries	1,000,000
Piping systems	150,000
Electrical equipment	200,000
Contingencies	150,000
Fixed charges and engineering	160,000
Total estimated cost	**$2,260,000**

No. 2 Boiler Performance Before and After Remodeling

Condition	Before Remodeling	After Remodeling	After Removal of Bottlenecks*
Date of Test	1/18/51	11/30/53	12/4/53
Turbine gross generation—Mw	19.8	25.0	27.0
Boiler steam output—M lb/hr	244	279	302
Feedwater temperature to boiler—F	355	352	358
Steam temperature superheater outlet—F	600	706	708
Steam pressure superheater outlet—psig	390	394	395
Boiler heat output—M btu/hr	226	291	313
Draft loss through boiler and air preheater—in. H_2O	7.0	10.8	9.2
Pressure loss boiler drum to main steam header—psi.	45	30	39
Flue gas temperature leaving boiler—F.	646	620	630
Flue gas temperature to stack—F	358	348	364
CO_2 in boiler exit gases—per cent	13.8	13.6	13.4

* Streamlining flue gas ducts and installing a small by-pass around the air preheater to reduce draft losses through the system.

Note that the increased capacity has been obtained with a reduction in steam pressure loss and with little or no increase in exit flue gas temperature. The lower CO_2 content of the flue gases indicated slightly more margin in draft available and, if necessary, the boiler output could be increased a few thousand pounds above the test figures shown.

ASTM Doing Research on Strength of Poles

American Society for Testing Materials has started a two-year, $150,000 research program designed to establish more precisely the breaking strength of wood poles.

Work is being conducted at U. S. Forest Products Laboratory, Madison, Wis. Project is under supervision of a technical subcommittee headed by R. P. A. Johnson.

As now planned, tests will be made on about 600 full-size poles of different species, and on some 15,000 small specimens taken from the poles to determine the quality of clear wood.

Objectives of the program are:

1. More accurate pole design standards.

2. Greater assurance of getting poles that are strong enough at reasonable cost.

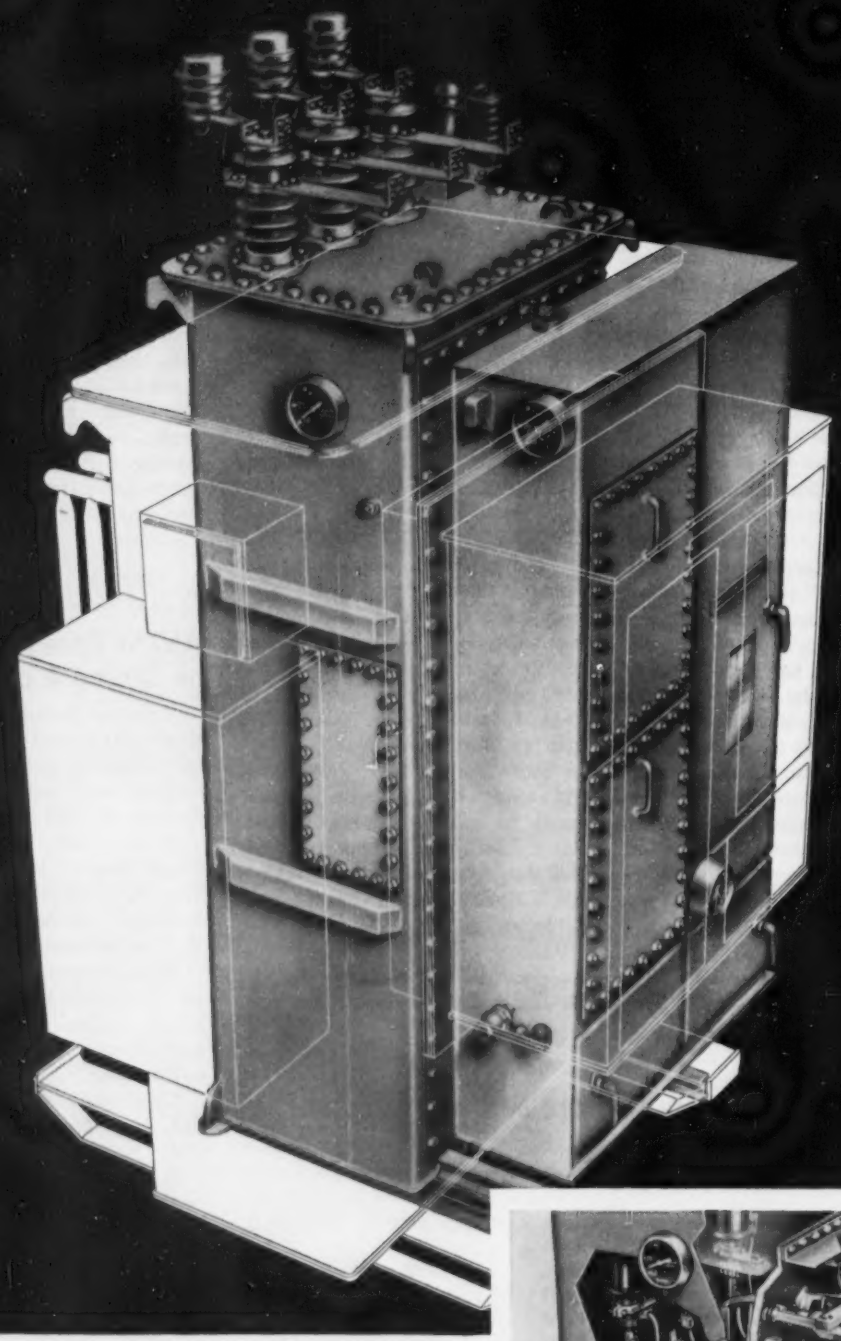
3. New information on the effect of preservatives on pole strength.

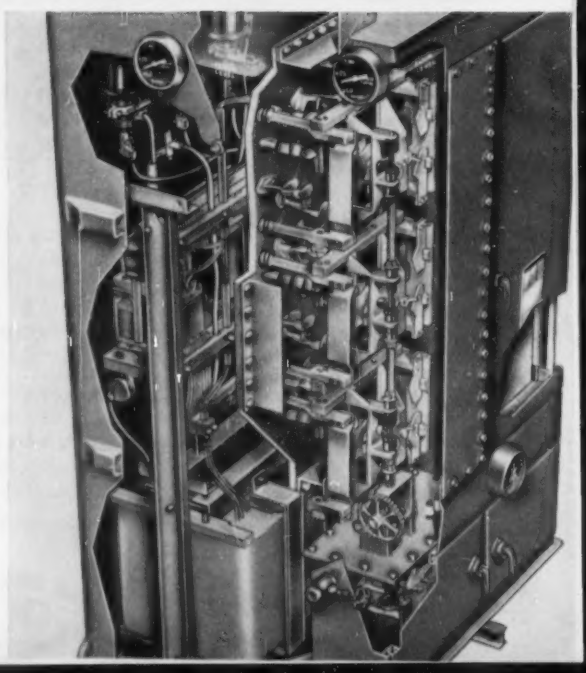
4. Better specifications that establish accurate relationships among different species.

5. Substantial savings to buyers and processors of poles.

L. J. Markwardt, chairman of ASTM's Committee D-7 on Wood, pointed out that data now in use are contradictory and unreliable.

New pole species have come into use, Markwardt added, further complicating the problem since allowable stresses have been developed from bending tests of small, clean, green specimens by converting the test results to pole stresses by means of a theoretical ratio.





The exclusive Westinghouse Tap Changer mechanism has been improved in the new URS. The three phases are arranged "in-line", permitting straight drive from operating mechanism to each phase. Stationary contacts are mounted on a MICARTA® barrier which also separates the tap changer from the transformer compartment. This *eliminates* cable connections in the tap changer compartment and assures complete separation of tap changer and transformer oil. A new unitized core and coil assembly has also been incorporated into the URS. All core and coil units are assembled into a single unit structure independent of the tank, making it easy to remove should maintenance become necessary. These two features are just a few of the many advances which are available to you through continuing Westinghouse efforts to provide better, more reliable voltage regulation apparatus.

THE NEW URS STEP-TYPE STATION REGULATOR . . .

52% smaller, 35% lighter . . . retains ± 1% accuracy for life!

Retaining all the stamina of its predecessor, the new URS Regulator gives accurate, trouble-free regulation in the most compact, easily installed "package" attainable today. In some ratings the new URS is actually 52% smaller, 35% lighter than before. In *all* ratings, size and weight have been greatly reduced.

Better station layout is possible from the URS reduced size—can be installed with smaller pad, no change in station overhead structure.

NEMA standards were used in the new URS to help you in specifying and using regulators in your systems . . .

- Position indicator, easily seen from both control and mechanism compartments
- Terminal drilling, clamp-type terminals can be interchanged
- Jack clearances, same as ASA transformer standards

Lifetime accuracy, reduced maintenance because Westinghouse went much further than just a theoretically better design. Experimental models were built, tested, refined. The SJS Relay . . . Unit Core and Coil Assembly . . . Recessed, "In-Line" Tap Changer . . . are just a few of the many features giving the new URS ± 1% accuracy for a lifetime.

Proved, exclusive features retained, improved to give utilities every service-tested advantage for accuracy and reliability . . .

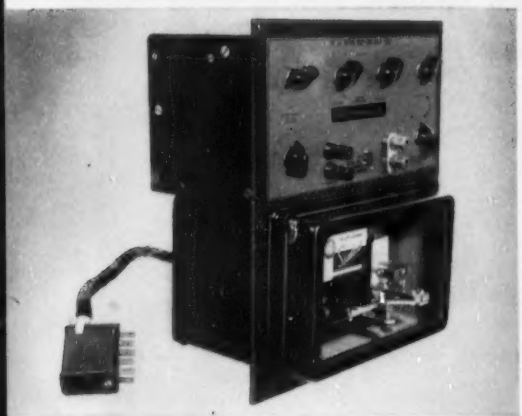
- Reversible terminals permit external interchange of source and load
- Out-breathing only on tap changer prevents oil deterioration
- Geneva gear drive, giving controlled optimum contact speed by direct drive
- Barrier-mounted contacts, no cables in tap changer compartment

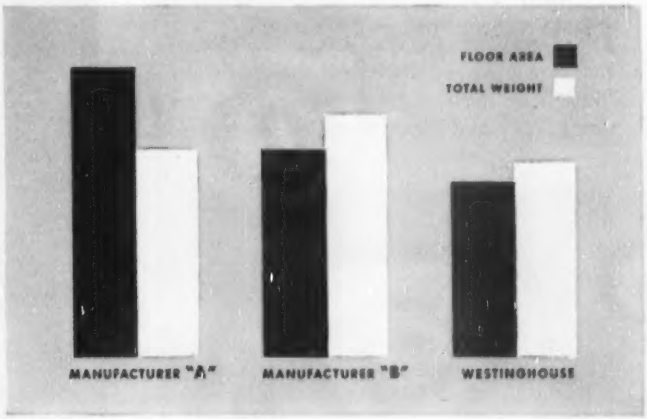
Get full information—NOW

The new URS Regulator has so many extra advantages that it sets a new standard in station-type voltage regulation. Get full technical data and information on how it can bring real accuracy and reliability to your regulation problems. Ask your Westinghouse salesman or write: Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-10420

YOU CAN BE **SURE**...IF IT'S

Westinghouse





SJS Relay and Control have been specially designed to give ± 1% accuracy for a lifetime. Wear is completely eliminated, there are no mechanical bearings or pivot points. The spring-hinged relay has been subjected to an uninterrupted laboratory test of over 100 million operations under full load—the equivalent of 200 years of actual service—and not a bit of recalibration or maintenance was necessary! **Substantial reduction in size** makes the new URS Step-Type Station Regulator the smallest and lightest of its class in the industry. With the URS lifetime accuracy and reliability, these advancements give utilities the most precise voltage regulation obtainable in its class.

No. 5
IN A SERIES

AN ENGINEER ASKS—

"why, even in severe sleet storms which caused conductor and tower failures, have we never had a mechanical failure with a PINCO 1060?"

HERE'S THE REASON

The answer to this question can be summed up in one statement . . . it is because Pinco Suspension Units are *designed and built to meet service needs* and not just to meet specification requirements. In other words, the correct basic design and rugged construction of Pinco Suspension Units provide extra mechanical and electrical strength for that added margin of safety even under the worst operating conditions.

PINCO SUSPENSION INSULATORS are *better* insulators because—

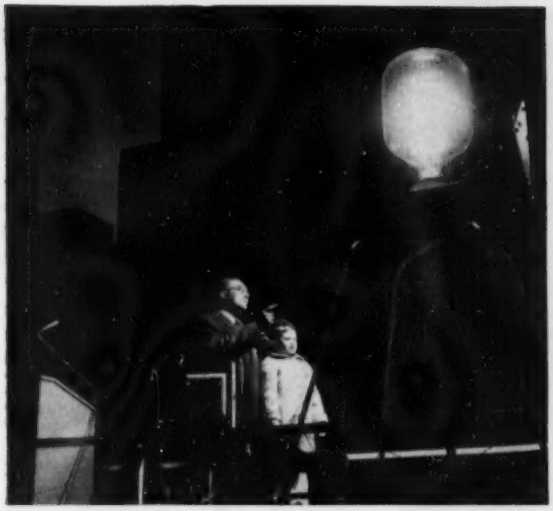
they are 10% HEAVIER!...
at least 20% STRONGER!...
and 25% BETTER ON IMPACT TESTS!... **proof that they are always "RIGHT for the Job" and "RIGHT on the Job." Remember this when you specify and buy suspension insulators.**

• For complete information regarding the Pinco 1060 and other Suspension Insulators, refer to Pinco Catalog No. 49, Pages 62 to 73.

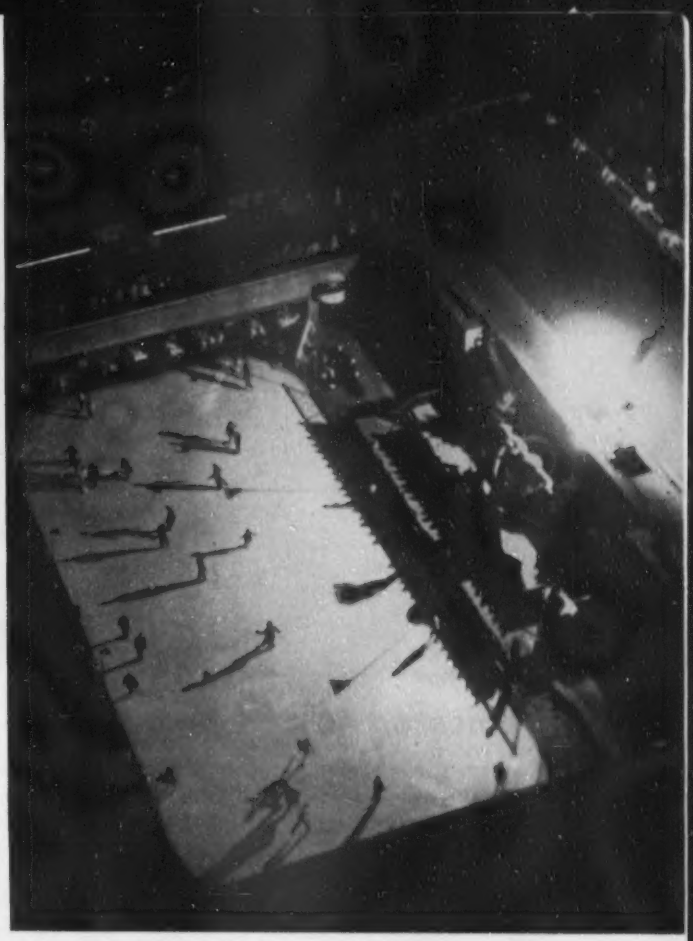
PINCO INSULATORS

The Porcelain Insulator Corporation
LIMA, NEW YORK

RIGHT ON THE JOB—



LAMP WAS LIGHTED by Charles E. Wilson, former GE president and a leader in Light's Diamond Jubilee, and Cynthia Kruesi, seven, great-great-granddaughter of John Kruesi, who put Edison's lamp together



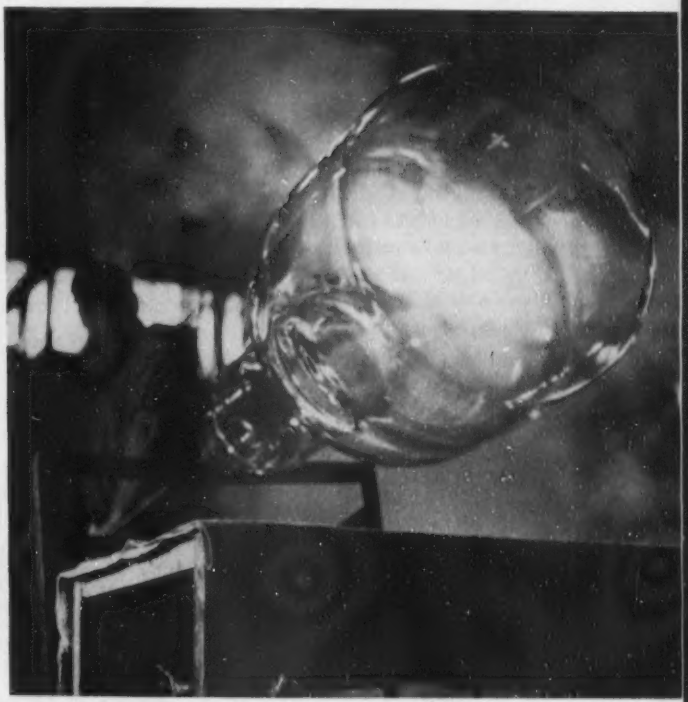
ALL OF ROCKEFELLER CENTER was set alight by the unshielded bulb. A major league ball park could be lighted by 23 such units

For Edison's 107th Birthday:

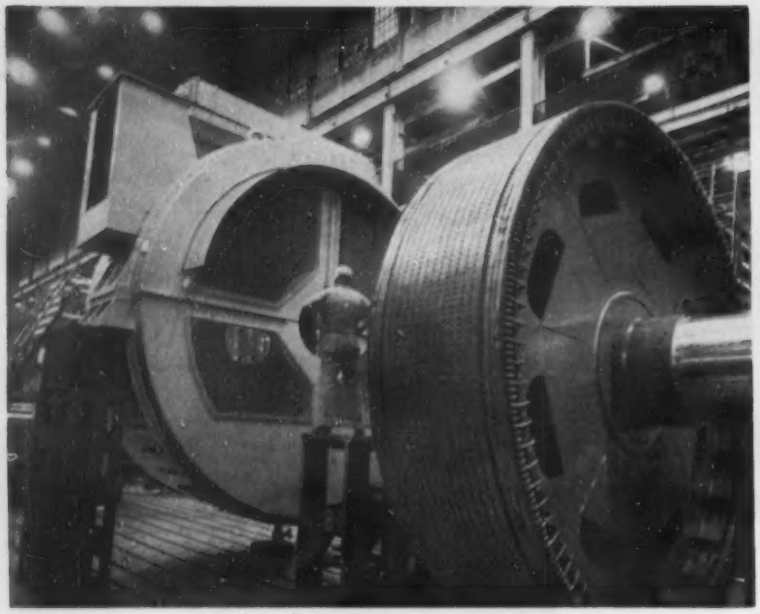
A 75-Kw 'Candle'

Seventy-five years ago Edison perfected his most famous invention: the incandescent lamp. To commemorate the event, General Electric Co, of which he was a founder, this year built a 75-kw bulb that dwarfs the original in size and intensity (See Cover). The company chose Feb. 11, Edison's 107th birthday anniversary, to put it on display at Rockefeller Center in New York. The lamp and two like it will be shown throughout the year at Light's Diamond Jubilee celebrations, culminating Oct. 21, anniversary date of the invention.

AS THE NORTH WIND, so blows Louis Gauss, veteran gaffer for Corning Glass Works, Corning, N. Y., to make world's largest bulb



HUGE BUBBLE, destined to house GE's 75-kw light source, is taken from mold in which it was blown for shipment to Nela Park lamp lab



Dedicated to Breaking the Ice

World's largest capacity single-armature direct current motor—10,500 hp—is shown above at Westinghouse Electric Corp's East Pittsburgh plant. Together with its twin, the motor is part of marine propulsion equipment soon to be installed in the U. S. Navy's newest and fastest icebreaker. At right is the armature or rotating part which will be inside the frame at left. The motors will be powered by ten 1,700 kw generators. Westinghouse will also install electrical equipment to operate a heeling device to enable the cutter to "rock" itself free of imprisoning ice.

MANUFACTURING BRIEFS

Bulldog Electric Products Co, Detroit, has established a Canadian subsidiary to operate throughout the country as Dominion Bulldog, Ltd. Plant and offices are located in Toronto. A contract with Amalgamated Electric Corp, Ltd, as exclusive Canadian manufacturer and selling agent for Bulldog will terminate May 1.

Canadian Fairbanks-Morse Co, Ltd, has entered the television field, having receivers in production in Toronto. Sales will be supported by the company's 16 branches and more than 2,000 dealers across Canada.

Brown Boveri Works, Baden, Switzerland, has obtained an order for machines and equipment for an 18,000-kw power plant for the town of Jeddah in Saudi Arabia. Together with another Swiss firm, the Constructions Metalliques de Vevey, it has also been entrusted with manufacture of electric equipment for the Canastra hydro plant in the Rio Grande del Sul province of Brazil. The equipment will consist mainly of two groups of 20,000 kw each.

SALES ASSIGNMENTS

COMPANY STAFFS

Graybar Electric Co has named R. L. Shuck manager of its new branch at 524 E. St. Louis St., Springfield, Mo., and R. V. Johnson manager of a new branch at Sioux Falls, S. D. Its branch at Aberdeen, S. D., has been closed.

Olin Industries' Electrical Division has named five new district sales representatives. They are: Ralph J. Mennemeyer, covering Georgia, Florida, parts of Alabama, South Carolina, and Tennessee, with headquarters in Atlanta; Dale Nolder, covering parts of Ohio, Michigan, and Indiana, with headquarters at Columbus; Chris H. Christensen, covering the Michigan area, with headquarters in Detroit; Edward W. Penno, covering parts of Illinois, Indiana, and Michigan, with headquarters in Chicago; and Benjamin E. Swenson, upper Midwest sales representative, with headquarters in Milwaukee.

MEETINGS CALENDAR

Canadian Electrical Association
Western Zone Meeting, Royal Alexandra Hotel, Winnipeg, Man., March 1-3; Annual Convention, Murray Bay, Quebec, Que., June 24-26.

Pennsylvania Electric Association
Relay Committee, Benjamin Franklin Hotel, Philadelphia, March 4-5.

Southern Safety Conference-Exposition
Kentucky Hotel, Louisville, Ky., March 7-9.

National Electrical Manufacturers Association
Spring Meeting, Edgewater Beach Hotel, Chicago, March 8-11.

Interstate Power Club
Meetings will be held at Hotel Martinique, New York, on following dates: March 10, May 10, Oct. 11, Dec. 6.

American Society of Mechanical Engineers
International Meeting, through cooperation of Mexico Section, Hotel Del Prado, Mexico City, Mexico, March 10-12; Semi-Annual Meeting, William Penn Hotel, Pittsburgh, June 20-24; Fall Meeting, Schroeder Hotel, Milwaukee, Wis., Sept. 8-10.

***Atomic Industrial Forum, Inc.**
Hotel Biltmore, New York, March 15-16.

National Association of Corrosion Engineers
10th Annual Conference and Exhibition, Kansas City, Mo., March 15-19.

Edison Electric Institute
Industrial Relations Committee, EEI Headquarters, New York, March 18; 20th Annual Sales Conference, Edgewater Beach Hotel, Chicago, April 5-8; EEI-AGA Accounting Conference, Hotel Statler, Boston, April 12-14; Industrial Relations Committee, Netherlands Plaza Hotel, Cincinnati, Ohio, April 15; 22nd Annual Convention, Atlantic City, N. J., June 1-4.

Pacific Coast Electrical Association
Engineering and Operating Sections, Mark Hopkins Hotel, San Francisco, March 18-19; Administration Services Section, Hotel Claremont, Berkeley, Calif., April 7-8; Annual Convention, Hotel Del Coronado, Coronado, Calif., May 19-21.

Southeastern Electric Exchange
21st Annual Meeting, Boca Raton Hotel, Boca Raton, Fla., March 22-24; Spring Meeting, Engineering and Operation Section, Sans Souci Hotel, Miami Beach, Fla., May 6-7.

American Power Conference
Sherman Hotel, Chicago, March 24-26.

American Institute of Electrical Engineers
Conference on Feedback Control, Claridge Hotel, Atlantic City, N. J., April 22-23; Northeastern District Meeting, Hotel Van Curler, Schenectady, N. Y., May 5-7; Conference on Telemetering, Morrison Hotel, Chicago, May 24-26; Summer General and Pacific General Meeting, Hotel Biltmore, Los Angeles, June 21-25; Fall General Meeting, Chicago, Ill., Oct. 11-15.

American Public Power Association
Annual Meeting, Hotel Morrison, Chicago, May 4-6.

Public Utilities Advertising Association
National Convention, Hotel Statler, Boston, May 13-14.

National Association of Electrical Distributors
Annual Convention, Atlantic City, N. J., June 6-11; Pacific Zone Convention, Mark Hopkins Hotel, San Francisco, Oct. 4-7.

***World Power Conference**
Sectional Meeting, Rio de Janeiro, Brazil, July 26-Aug. 10.

***Pan-American Federation of Engineering Societies**
(UPADI), Third Convention, Sao Paulo, Brazil, Aug. 2-12.

*Additions this week.

Station insulators are a capital investment for a power company. How is such an investment evaluated?

This is a long-term investment. TIME is a much bigger consideration than price, since the number of dollars involved is small in the over-all picture, and the difference in price between various makes of insulators is still smaller, by virtue of competition. Therefore, the question resolves itself simply into buying the largest possible piece of the future with today's dollars.

Can it be shown, sensibly, that one insulator has any better future than another? If so, such an insulator has the highest "investment value".

You can't predict the future by laboratory test. But don't forget, today *is the "future"* of thousands of insulators bought twenty years or more ago. The performance of those old-timers is part of the records of power companies. We can't change it. On the basis of that record, new insulators are bought. Therefore, this becomes significant — a great percentage of all orders for O-B station insulators comes from past users; people who have waited for the future, kept track of it, and are now cashing-in on what they have learned.

Just remember, new insulators are at least outwardly the same. Industry Standards assure this. But, no standard deals with the future, and the value of your insulator investment is measured by *how long they stay new.* When TIME is what you're buying, you get the biggest piece of it by specifying "O-B".

Ohio Brass

MANSFIELD (B) **OHIO, U.S.A.**

IN CANADA: CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT. 4421-99

New Hampshire PSC Order . . .

. . . grants substantial portion of $1,029,086 annual rate hike requested by Public Service Co of New Hampshire

The Public Service Commission of New Hampshire, on an order dated Jan. 29, 1954, has granted substantially all of the $1,029,086 annual rate increase requested by the Public Service Co of New Hampshire.

In its order the commission stated that "The Public Service Co of New Hampshire justifies its representation that it is entitled to increased rates on the findings of the commission, enunciated in its Supplemental Report of Feb. 4, 1953, in D-R3152, Public Service Company of New Hampshire, 35 NHPUC 13, which allowed a 5.65% return on a rate base then established at $74 million."

Rate of Return Off . . . The commission continued: "At the time of filing the rates herein under consideration, the company submitted that, figured on an average rate base, its rate of return declined from 5.18%, as of Dec. 31, 1952, to 5.05%, as of July 31, 1953. The filed rates were designed to produce a 5.65% return on the company's rate base, as of July 31, 1953, represented to be $83,428,734, which, during the hearings, was increased to $83,459,089."

Among the intervenors in the proceedings was the Deputy Attorney-General, representing the state, who ". . . submitted expert testimony and exhibits designed to demonstrate that it is possible and proper to effect a substantial reduction in the amount of working capital which the company included in its rate base, by analyzing the circumstances under which the company receives its revenues and pays its bill, and by showing that large amounts of money become available to, and may be used by, the company in advance of the time when said money has to be paid out, the largest single item of such funds being federal income tax accruals."

The order went on to say "The state submits that if the company's representations were adjusted, as generally outlined above, an annual increase of revenue not in excess of $786,069 would result in a 5.65% rate of return on the company's rate base, so adjusted."

Among contentions made by industrial customers is that, in the pro-forming of the test-year rate base, there was no reflection of the fact that the Schiller Plant No. 1, which represents approximately $10 million of the rate base, was not in operation for three months of the test year.

The commission order continued: "Counsel represents that the spreading of the maintenance expense occasioned by the Schiller No. 1 breakdown is not properly done, with the result that the impact of these maintenance expenses is more than should be charged to the test year.

"Counsel also represents that the loss incurred by the company in its appliance department should not be charged to industrial customers . . . (since they) receive no benefit from the activities of this department.

Working Capital . . . "With respect to working capital, counsel for industrial customers submits that an offset should be made to the Deferred Income Tax account, and that the company's bank balances should be scrutinized critically."

Counsel for these industrial customers concluded that "It is also represented that generating units which the company plans to retire shortly should be eliminated from the rate base calculations in the instant case."

The PSC, in its own analysis of the case, stated: "One of the points in dispute is the treatment of sales and new business department **loss,** [emphasis supplied] so-called . . . The commission has long felt that company management should give more attention to this department, and take whatever steps are necessary to lift it out of the red. It appears that promotional costs are a proper charge to general expenses and not to the merchandise department, as now done under our Classification of Accounts. **This would, obviously, reduce the loss item materially"** [emphasis supplied].

The commission said, significantly, "In this case, many novel suggestions for normalizing have been made. One always leads to another. It appears that if an attempt is made to treat every abnormal circumstance in a test year, it removes any margin of safety to protect the company from sleet storms, floods, etc., which seem to be ever recurring. Also when we start normalizing, we cannot avoid such items as promotions, increased employment, additional taxes, etc. We prefer not to confuse the test-year method by any such nebulous theories."

Federal Income Taxes . . . As to federal income tax accruals, it had this to say: "It is impossible to determine, or attempt to determine, what federal taxes of the company will be in 1954, or how these taxes are to be paid. Small reductions may be authorized, and the payments are probably to be made earlier by the company than at present. While a slight reduction in federal income taxes of the company is possible in 1954, an earlier payment requirement of these taxes will so reduce tax accruals that the result will probably be a stand-off."

The PSC also refused to accept contention of the industrial users that downward adjustments should be made in the rate base for plant temporarily out of service or plants which are about to be retired.

The commission, in its rate base findings, adjusted the company's working capital requirements to reflect a 54-lag-day factor in connection with operation and maintenance expense. The average adjusted rate base as of Sept. 30, 1953, was determined to be $84,750,981 on which the required return of 5.65% indicated an income deficiency of $486,349, or additional gross revenue requirements of $1,013,227, or amount of ordered increase.

Commissioner Edward R. Thornton, in his dissent, pointed out that ". . . the majority opinion fails to give any consideration or weight to the decisions of this commission in regard to the use of income tax accruals for working capital . . . and fails to take notice of the sums accruing in the hands of the company by reason of its acceptance of Defense Production Administration Certificates permitting accelerated amortization for federal income tax purposes."

FINANCIAL

Bidding Proposal Causes Furor

SEC's offer to relax rule on competitive bids to buy utility securities runs into heavy fire at public hearing

A proposal of the Securities and Exchange Commission to relax its rule requiring competitive bidding for purchase or underwriting of securities issued by subsidiaries of registered utility holding companies is running into heavy fire.

Last week such staunch supporters of competitive bidding as Robert R. Young and Ex-Sen Burton K. Wheeler appeared at a public hearing called by the commission to oppose a modification of SEC rules issued under the Holding Company Act. The Securities and Exchange Commission rule change would permit a return to private negotiations on securities offered by utility subsidiaries.

Senator Wheeler in Melee . . . Young, taking time out from his fight to gain control of the New York Central Railroad, called the attempts at changing the competitive bidding rule akin to "treason in the canyons of Wall Street." Senator Wheeler, who co-authored the Holding Company Act of 1935 and represented Young's Allegheny Corp, made this comparison:

The rule at issue is one dubbed U-50. Adopted by SEC in 1941, it was designed to eliminate certain abuses in utility company financing. The Holding Company Act itself provides for exemption from SEC regulation—through rules, regulations or order—of the sale of a utility subsidiary's securities if approved by a state commission. However, each exemption made under this statutory provision has been granted by special order only, requiring the same degree of SEC regulation as non-exempted issues.

The Holding Company Act points to certain evils which it is designed to eliminate and which SEC must bear in mind in carrying out the law. Among them are: (1) an absence of arms-length bargaining, (2) restraint of competition, and (3) lack of economies in the raising of capital.

Demmler's Opinion . . . SEC Chairman Ralph H. Demmler believes that if state regulation is adequate to protect against these evils (or if they are no longer a threat), then the imposition of competitive bidding by SEC can be eliminated. Demmler also doubts the federal government needs to require such bidding for securities of operating utility companies in a proceeding duplicating a state regulatory proceeding.

Arrayed against Young and Wheeler, and in support of the proposed change, are many of the same banking interests which opposed the rule when it was adopted in 1941. Among them were Morgan Stanley & Co, The First Boston Corp, Lehman Bros, Stone & Webster Securities Corp, and Blyth & Co. At least ten major holding companies also have endorsed the change, though most think SEC isn't going far enough to put regulatory powers back in the hands of the states. Among them were Southern Co, Ohio Edison Co, American Gas & Electric Co, Central & Southwest Corp, and Wisconsin Electric Power Corp.

Oppose Change . . . Among others siding against the change are a few smaller underwriters, such as Halsey, Stuart & Co, Inc, Baxter, Williams & Co, the Congress of Industrial Organizations, the National Rural Electric Cooperative Association, and several railroad brotherhoods.

Opponents charge SEC will take a long step backward if it makes the change in Rule U-50. They claim competitive bidding is the only satisfactory means of "cleaning up utility financing and lifting the dead hand of the traditional banker." They argue that since competitive bidding is not mandatory in most of the states, the effect of the change will be to abolish it for many of the 124 subsidiary companies probably under U-50. And they point to charts which show the bankers' commissions in utility debt financing from 1941-1954 were 95% more on negotiated sales than on competitive bidding, to bolster their argument that competitive bidding means cheaper financing and hence savings for utilities, consumers and investors.

Answers Charges . . . Edward R. Wardwell, counsel for Morgan Stanley & Co, replied at the hearing to the various charges made by opponents of the rule change that there is or has been banker domination in utility financing. He added his solemn amen to this quotation from the opinion of Federal Judge Harold Medina dismissing the government's recent investment bankers antitrust suit:

"The myth of domination and control of issuers by investment bankers, at least in the post securities act period . . . which was fostered by the ex parte TNEC proceedings and blown up by the long-continued propaganda in favor of compulsory public sealed bidding should perhaps be given a decent burial and quietly laid to rest."

Of the 22 state regulatory commissions which have communicated with SEC so far, nine specifically endorse the rule change. Only three—Iowa, Nevada, and South Dakota—claim no authority to regulate securities sold by utilities in their jurisdictions.

SEC, which announced its re-consideration of Rule U-50 last November, is giving interested parties additional time until March 15 to file written comments and will hold another public hearing March 31.

FINANCIAL BRIEFS

New England Electric System is planning to raise $11.5 million next November by sales of common stock . . . **Texas Utilities Co** expects to sell 250,000 shares of common stock around April 13.

Oklahoma G&E has asked Corporation Commission approval to raise rates 10% annually . . . **Kentucky House** gets Rep George R. Martin's bill which calls for repeal of the state's 3% tax on gas, light, water, and telephone bills.

SEC Proposal . . .

. . . considers changes in holding companies' annual report form to streamline paper work

The Securities and Exchange Commission has announced a proposal to streamline the paper work involved in meeting SEC annual reporting requirements by registered holding companies (EW, Feb. 22, p 198).

U5S Form Involved . . . The commission is considering changes in the annual reporting Form U5S used by registered holding companies under the Holding Company Act. Comments on the proposal are being taken by SEC until March 10.

If the proposed form is adopted, both a holding company and its subsidiary could use it to meet the additional reporting requirements of the Securities Exchange Act. If a subsidiary used this option, only additional information necessary would be exhibits to keep its filings current and the financial schedules which do not appear anywhere else in the report.

The new form officially calls for holding companies and subsidiaries to furnish SEC with copies of their annual stockholder reports and requires filing state commission reports covering operations not reported to the Federal Power Commission.

Utility Regulation . . . Two other aspects of current SEC activity center on utility regulation. On one, SEC held public hearings recently on its proposal to amend the Rule U-50 setting up competitive bidding requirements on all utility security issues (See p 63). The amendment would exempt from SEC bidding rules, sale of a utility subsidiary's stock if the sale has been approved by a state regulatory commission.

The other development is a snag in SEC's intentions of last year to set up standards for approval of utility employee incentive plans. Last May the commission indicated in letters to various utilities that it favored approval of employee stock option plans, provided they met certain standards. These letters suggested requirements that might be adequate to meet SEC approval. Although several plans were submitted, no plan has been approved. However, the whole question will be heard by the commission on April 8.

Today in Utility Finance

YIELDS (%)

Quality	Bonds			Preferred Stocks			Common Stocks		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
DATE 1954									
Feb. 18	**2.89**	**2.95**	**3.19**	**3.97**	**4.12**	**4.48**	**4.89**	**5.31**	**5.41**
Feb. 11	2.86	2.92	3.18	3.97	4.11	4.47	4.86	5.31	5.38
END OF QTR.									
4th 1953	3.07	3.12	3.34	4.17	4.32	4.62	5.07	5.57	5.51
3rd 1953	3.30	3.33	3.54	4.35	4.52	4.83	5.36	5.97	6.01
2nd 1953	3.34	3.46	3.64	4.47	4.70	4.88	5.52	5.93	6.10
1st 1953	3.15	3.23	3.39	4.16	4.41	4.66	4.95	5.24	5.50

Data: Reis & Chandler, Inc.

EARNINGS

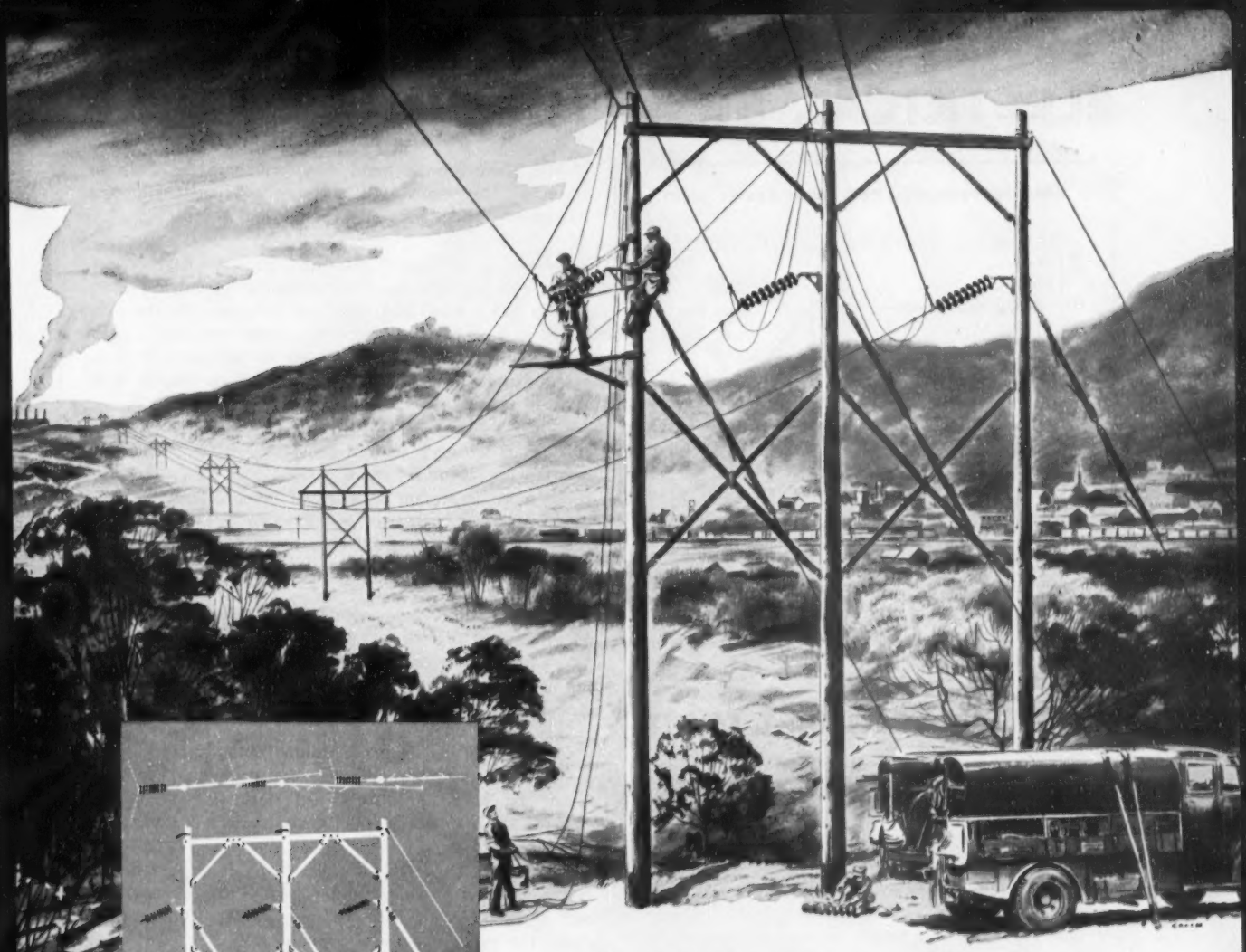
Company	Period Months Ended		Net Income 1953	Net Income 1952	Earnings Per Common Share 1953	Earnings Per Common Share 1952
Cleveland Electric Illuminating	12	Dec.*	$14,765,329	$12,669,557	$4.07(a)	$3.45(a)
Detroit Edison, consolidated	12	Dec.#	20,520,004	17,196,307	1.96(b)	1.77(b)
Florida Power, consolidated	12	Dec.#	5,179,274	4,251,264	1.89	1.80
Long Island Lighting	12	Dec.**	7,732,800	6,311,900	1.28(c)	1.26(c)
Niagara Mohawk Power	12	Dec.#	26,343,395	23,131,877	2.03(c)	1.92(c)
Southern California Edison	12	Dec.*	21,872,010	23,970,515	2.56	3.21
Union Electric Co of Missouri	12	Dec.*	16,104,000	14,886,000	1.36	1.23

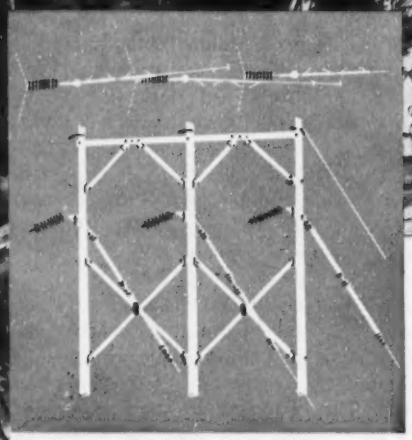
Notes—*—Subject to year-end audit; **—Revised because of year-end tax adjustments; #—Figures shown have been audited; (a) Based on 3,342,308 shares; (b) Based on average shares outstanding; (c) Based on 4,979,777 shares in 1953 and 4,349,580 shares in 1952; and (c) Based on 11,556,036 shares in 1953 and 10,556,036 shares in 1952.

FINANCING

Company and Description	Amount of Offering (000)	Offering Price	Yield to Public
WEEK OF FEBRUARY 18-24			
Bonds			
Atlantic City Electric—1st mtg 3% due 1984	$5,000	100.625%	2.97%
Common Stock			
Atlantic City Electric—151,672 sh	$4,569	$30.125	4.98%
El Paso Electric—76,399 sh (being offered commonholders on 1-for-10 basis, record Feb. 23 to expire Mar. 11)	2,139	28.00	5.71
SCHEDULE FOR FEBRUARY—MARCH—APRIL—MAY			
Bonds			**Bid Date**
Houston Lighting & Power—1st mtg due 1989	$30,000	.....	Mar. 1
Tacoma, Wash.—light and power revenues due 1964-79	5,000	.....	Mar. 1
Suburban Electric—1st mtg due 1984	4,000	.....	Mar. 3
Omaha Public Power District—electric revenues due 1956-84	12,000	.....	Mar. 9
California Oregon Power—1st mtg due 1984	10,000	.....	Mar. 9
Alabama Power—1st mtg due 1984	17,000	.....	Mar. 16
El Paso Electric—1st mtg due 1984	5,000	.....	Mar. 16
Pennsylvania Electric—1st mtg	12,000	.....	Mar. 17
Pacific Power & Light—1st mtg due 1984	8,000	.....	Mar. 29
San Diego Gas & Electric—1st mtg due 1984	17,000	.....	Mar. 30
Georgia Power—1st mtg due 1984	11,000	.....	April 6
Southern Indiana Gas & Electric—1st mtg due 1984	8,000	.....	April 13
Ohio Power—1st mtg	20,000	.....	April 14
West Penn Power—1st mtg due 1984	12,000	.....	April 20
Utah Power & Light—1st mtg due 1984	15,000	.....	May 19
Community Public Service—1st mtg due 1984	3,000	.....	.....
New York State Electric & Gas—1st mtg	20,000	.....	.....
Nebraska Public Power System—electric revenues	18,600	.....	.....
Preferred Stock			
Long Island Lighting—70,000 sh $100 par	$7,000	.....	Mar. 3(a)
El Paso Electric—15,000 sh $100 par	1,500	.....	Mar. 16
Louisiana Power & Light—70,000 sh $100 par	7,000	.....	Mar. 23
Dallas Power & Light—70,000 sh $100 par	7,000	.....	Mar. 24
Northern States Power (Minn.)—150,000 sh $100 par	15,000	.....	April 14
Ohio Power—50,000 sh $100 par	5,000	.....	April 14
Arkansas Power & Light—70,000 sh $100 par	7,000	.....	April 20
Rochester Gas & Electric—50,000 sh $100 par	5,000	.....	.....
New York States Electric & Gas—50,000 sh	5,600	.....	.....
Common Stock			
Southern California Edison—600,000 sh	.....	.....	Mar. 2(b)
California Oregon Power—300,000 sh	.....	.....	Mar. 2(c)
Utah Power & Light—200,000 sh	.....	.....	Mar. 23
Southern Indiana Gas & Electric—114,166 sh (to be offered commonholders on a 1-for-7 basis, record about Mar. 24 to expire April 9)	.....	.....	.....
Wisconsin Public Service—316,867 sh (to be offered commonholders on 1-for-7 basis)	.....	.....	.....
Missouri Public Service—527,865 sh (to be offered commonholders on a sh-for-sh basis)	.....	.....	.....(d)
Northern States Power (Minn.)—1,219,864 sh (to be offered commonholders on 1-for-10 basis)	.....	.....	.....

Notes—(a) First Boston Corp—W. C. Langley & Co—Blyth & Co group, underwriters; (b) First Boston Corp—Dean Witter & Co group, underwriters; (c) Blyth & Co—First Boston Corp group, underwriters; and (d) Kidder Peabody & Co, underwriters.





Type No. 708 —
Medium Angle Structure*

Quantity	Description
2	Crossarm
3	Stud bolt ⅞" w/2 washer nuts and locknuts
2	Filler block
6	Stud bolt ¾" w/2 washer nuts and locknuts
4	Knee brace
3	Swinging angle bracket 2/plate and bolts
7	Machine bolt ⅞" w/sq. nut and locknuts
4	Flat washer 4" sq. x ¼", 15/16" hole
2	Curved washer 4" sq. x ¼", 15/16" hole
2 sets	Cross brace w/fittings, clamp, ⅞" pole bolts and curved washers
3	Pole band
3 pr.	Connecting link
1	Guy roller
1	Machine bolt ¾" x 2½"
6	Wood strain insulator
2	Suspension clamp for static wire
As req'd	Suspension insulators and fittings
As req'd	Guying material
3	Link

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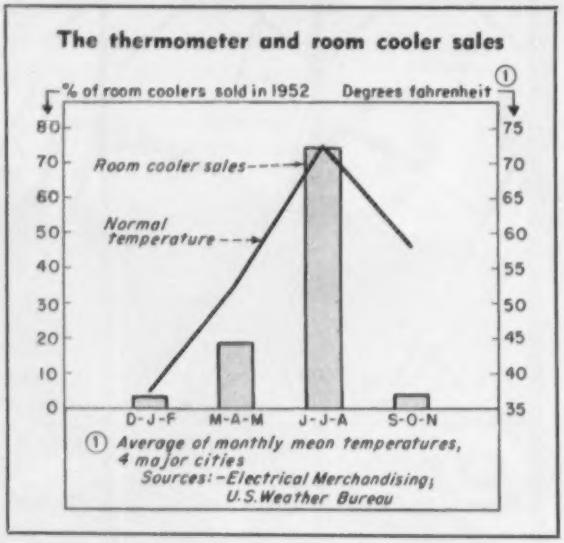


Room Coolers: Cream, but With Lumps

This may be a key year for the fast growing room air conditioning unit. The chances are that sales will increase again over last year's record total. At about 1,000 kwhr per unit per year, that means another substantial boost to summer residential power requirements. But at the same time, there may be more problems in selling room coolers than there have been up until now. Room coolers rank high among recent "growth products." Retail sales reached an estimated 800,000 or more units last year, about double the volume of 1952.

Future prospects for room coolers seem even brighter than their recent history. Only about 3.2% of wired homes now contain room coolers, according to Electrical Merchandising. Even the people who do have coolers may be sold extra ones. And a great part of the commercial market for cooling equipment is still untapped.

Not All Downhill . . . Nevertheless, the future growth of room cooler sales won't be all smooth and steady. The current trend in consumer income is one of the problems. Incomes have been declining as a result of the general decline in business activity—and they are likely to keep going down through most or all of this year. Actually, products with rapidly growing sales trends can sometimes come right through a recession with hardly a wobble in their sales curves. But it does not always work that way. Sales of home freezers dropped sharply in 1949, though freezers were still in the "growth" stage.

Obviously, it's too early to tell what will happen to sales of room coolers if consumer income declines through 1954. Their growth trend may overcome the drop in incomes. But that won't necessarily happen—although current talk about sales might imply that it will.

The weather is another problem. Extreme heat helped boost sales of room air conditioning equipment last year, and in 1952, more than 70% of room coolers are estimated to have been sold in three summer months. Unless utilities and appliance dealers learn to sell more without aid of extremes in weather, they will have trouble with inventories and load planning every cool summer.

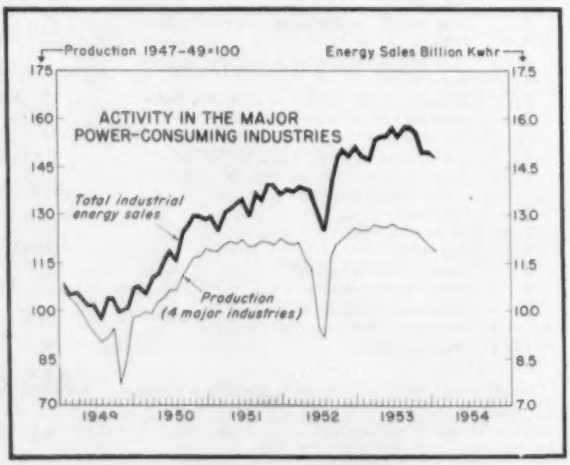
Inadequate wiring is a third problem. So far, it has not been an important deterrent to sales. But wiring will become more important as sales of coolers grow. Eventually potential customers will have to be persuaded to rewire, or the rewiring will have to be done for them as an incentive—or sales won't grow at rate they could.

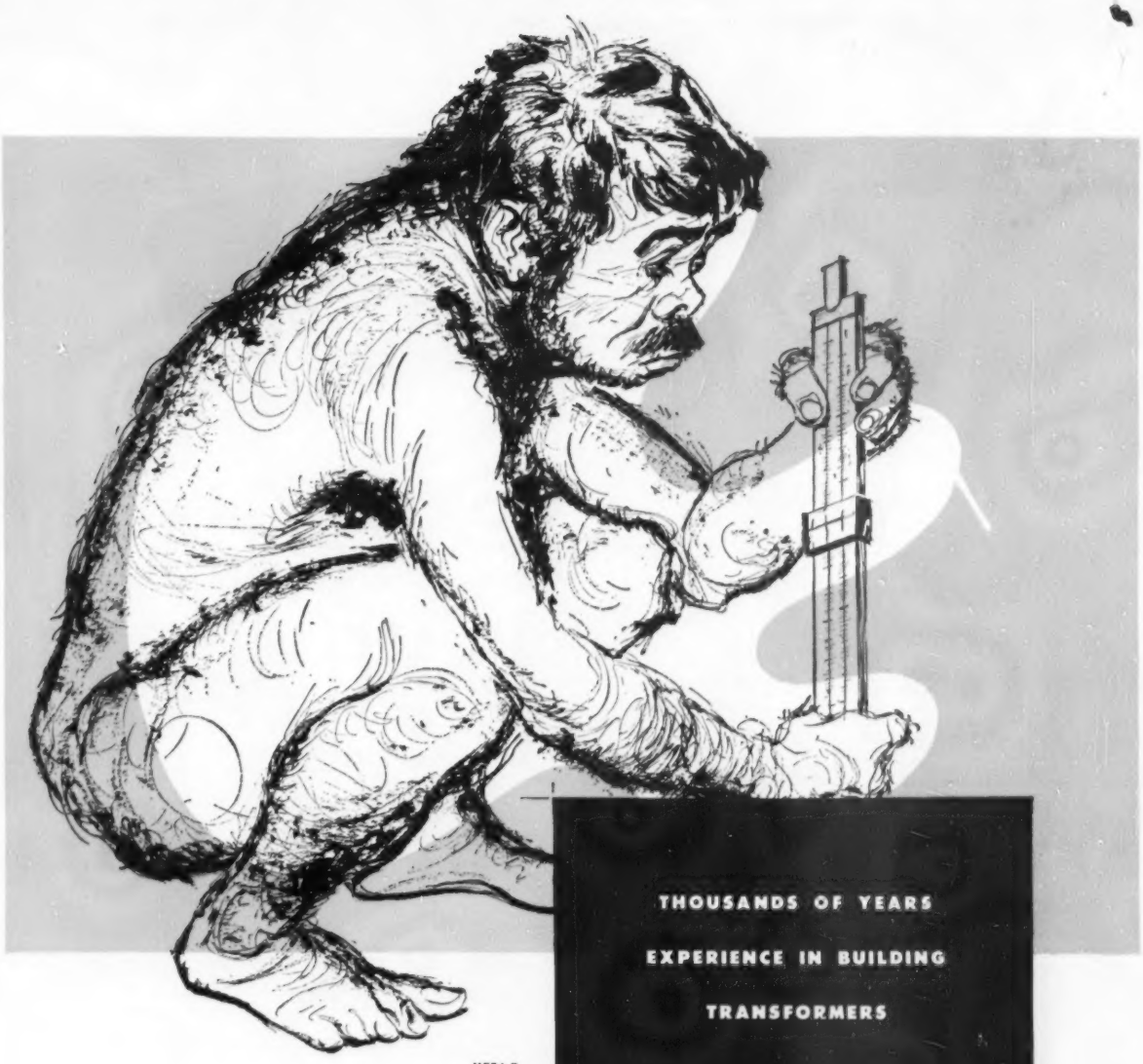
Then there's increased competition. More and more manufacturers and dealers are getting into the business. That's fine if it increases sales and residential power load. But it also means problems with price cutting, inferior products and improper servicing and handling.

Finally, there's the danger of undue optimism. Many—perhaps all—fast-growing appliances have this problem sooner or later. Producers and dealers overestimate their market just because sales go up rapidly at first.

Spring Hitters . . . Why do growth products sometimes disappoint their producers and sellers? Probably one answer is cost. Not all of the people with wired homes can afford the more expensive appliances.

Another reason is that newer and more attractive appliances come along and take part of the market. It's a good bet, for example, that some people who might like a home freezer put their money into television or room cooling last year. They may still buy the freezer. In the meantime they have helped slow down the growth curve that some of the producers and dealers were counting on.





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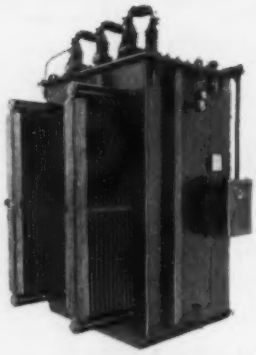

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